

BUSINESS

JOURNAL OF MANAGEMENT · PRODUCTION · PERSONNEL

JANUARY, 1946

1/6 Month

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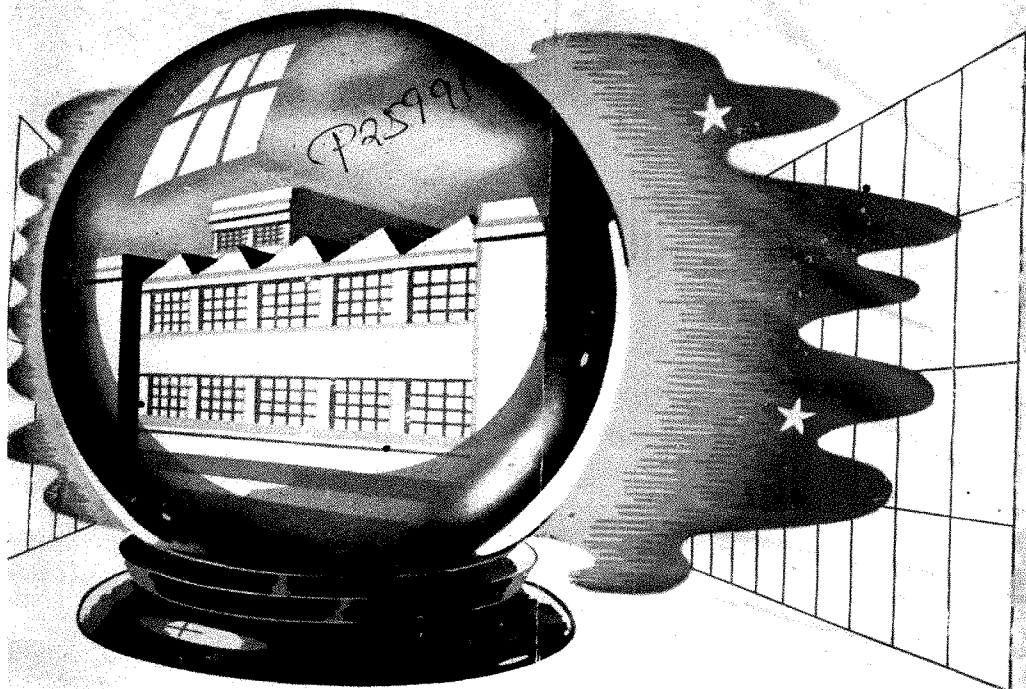
Stepping Up
P. M. H.

■
HOW HOOVER
RE-CONVERTED

■
Putting In
BUDGET CONTROL

■
SERVICEMEN INTO
SALESMEN.





LOOK INTO THE FUTURE

You, as a business man, are naturally looking into the future. You probably have the factory, up-to-date machinery, and are practically ready for the switch-over. But, are you entirely satisfied with your present heating system? Is it as efficient as you could wish? Is it economical? These points must interest you, and they certainly interest us for it is our business to fit factories, etc., with heating apparatus which combines efficiency with economy and costs little to install. May we ask our Technical Representative to call upon you and discuss the matter, without obligation, of course.

★ P, 25,991

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WE CAN HEAT THEM!

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ARTHUR DOCKING & CO. LTD.

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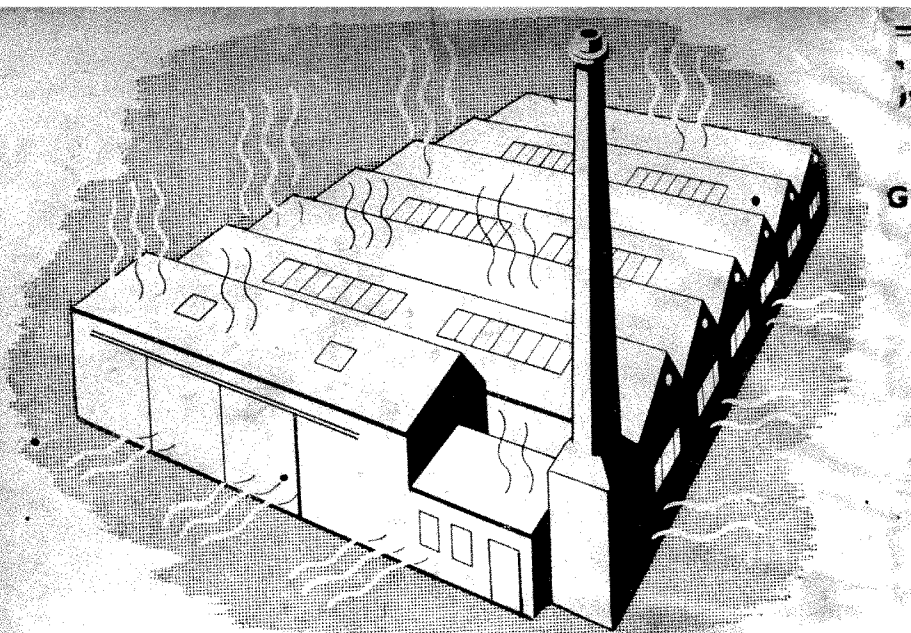
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Don't let that heat escape!

VERY VALUABLE WORK has already been done to insulate pipes and tanks by lagging, but it is probable that insufficient attention is still given in Works and Factories to the efficient insulation of whole buildings.

Specialist advice on this vital question is available in the Fuel Efficiency Bulletin NO. 12, "THERMAL INSULATION OF BUILDINGS," obtainable from your Regional Office of the Ministry of Fuel and Power.

POINTS TO REMEMBER ABOUT HEATING

- 1 Once a building has been heated up to the necessary temperature, fuel is only needed to *maintain* that temperature.
- 2 The speed at which a building cools (due to the escape of heat by various means) governs the amount of fuel which is required to replace the escaping heat and maintain the temperature.
- 3 Adequate insulation reduces the heat loss and, hence, less fuel is required to maintain the temperature. And, remember, the building will be cooler in summer.

***Remember . . .
effective insulation cuts fuel consumption***



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Following a policy of co-ordination and co-operation, Cable and Wireless Ltd. have raised international telegraphic communications to a high state of efficiency. The Holding Company, established in 1929 in agreement with the Governments of the British Empire, has secured the orderly development of communications by cable and wireless and has served the public well.

The Company has a capital of £30,000,000 and is entitled in the first instance to a standard net revenue of 4% on the capital. Half of any profit above this sum goes to reduction of rates and to development of the service, and half to the Company.

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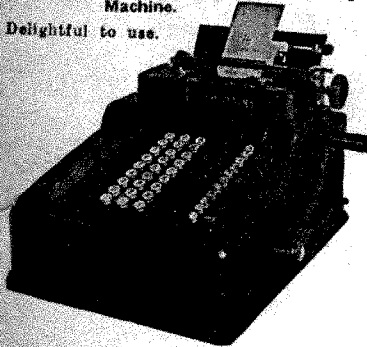
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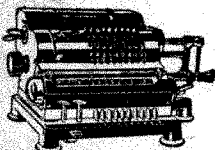


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For all calculations. Multiply, divide, add and subtract in 1/10th time taken to do so mentally.

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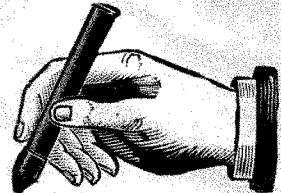
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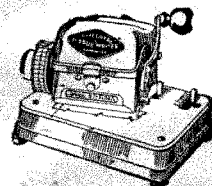


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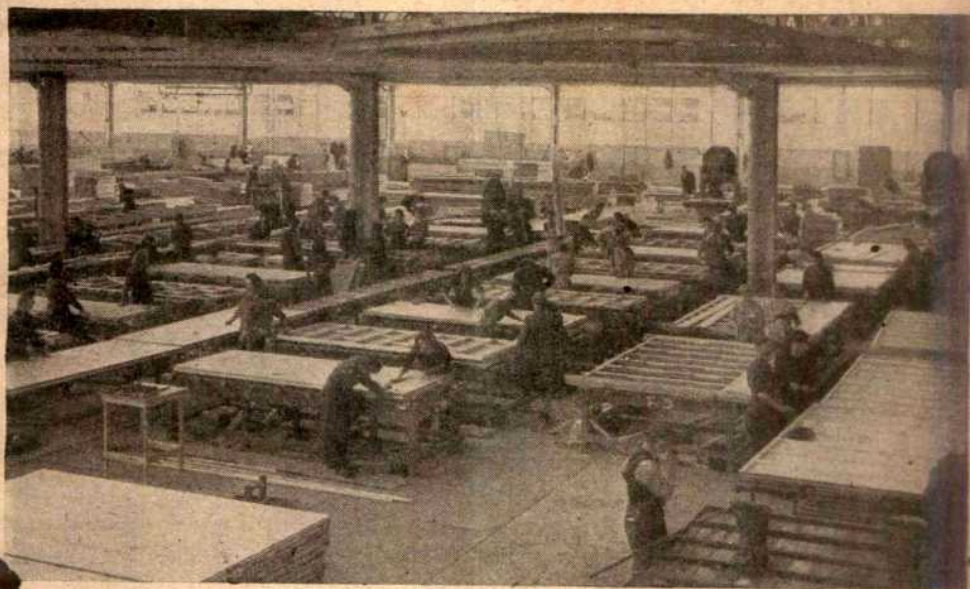
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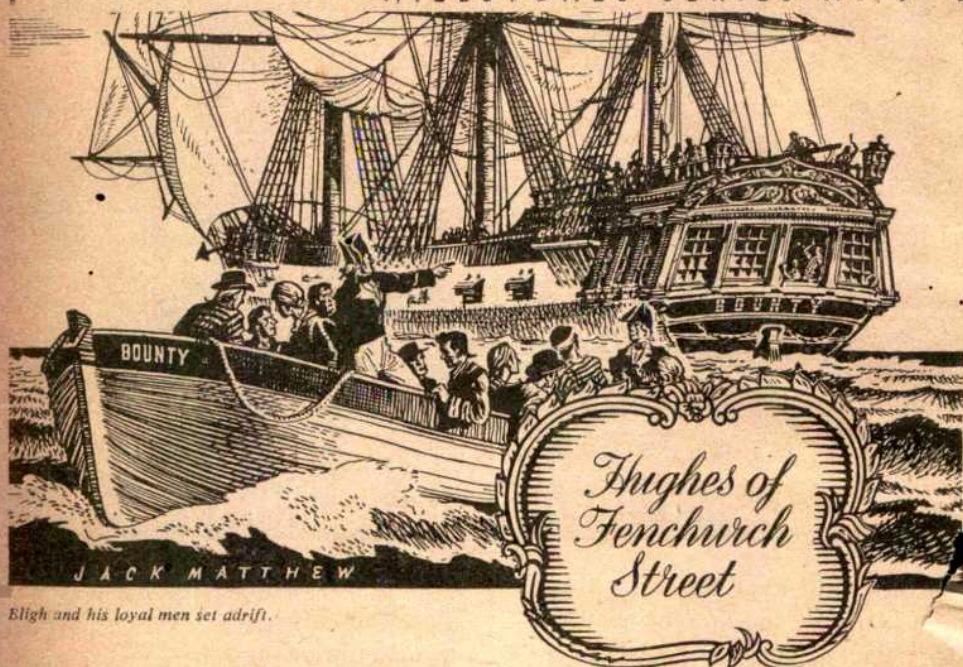
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32, Duke Street, St. James's, S.W.1.

Telephone: Whitehall 0321

Smiths of England

MILESTONES SERIES No. 9



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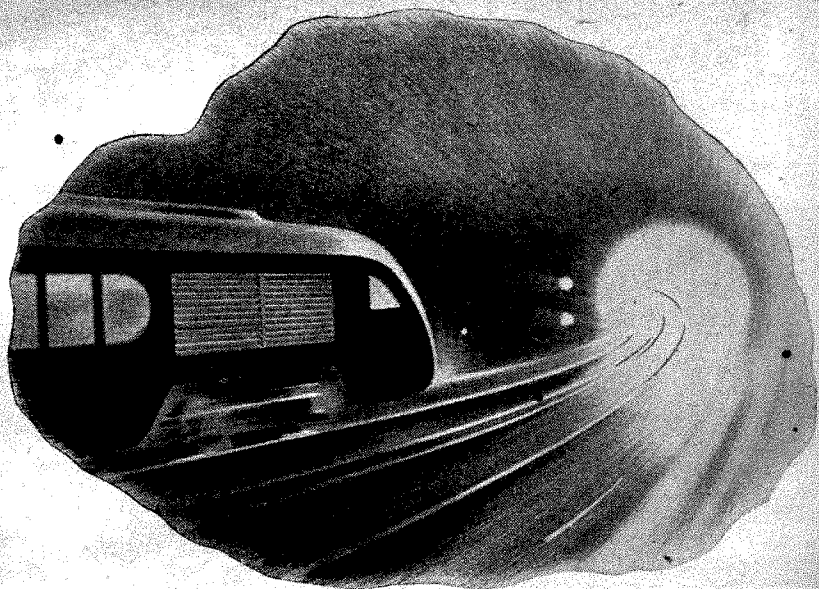
appropriately associated with the Smiths group of companies. He it was who opened the shop at 59, Fenchurch Street, in the City of London, which for more than a hundred years has supplied the needs of the navigators, explorers and others connected with the sea. The firm has tremendously increased its productive capacity and today instruments made by the Barkingside factory are found as standard equipment on ships and aircraft the world over.

S. SMITH & SONS



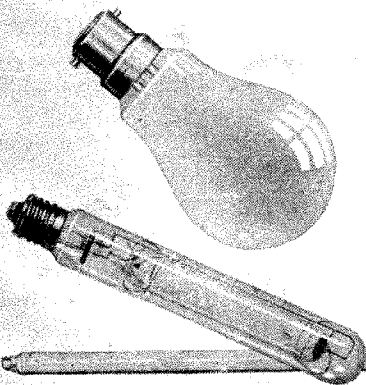
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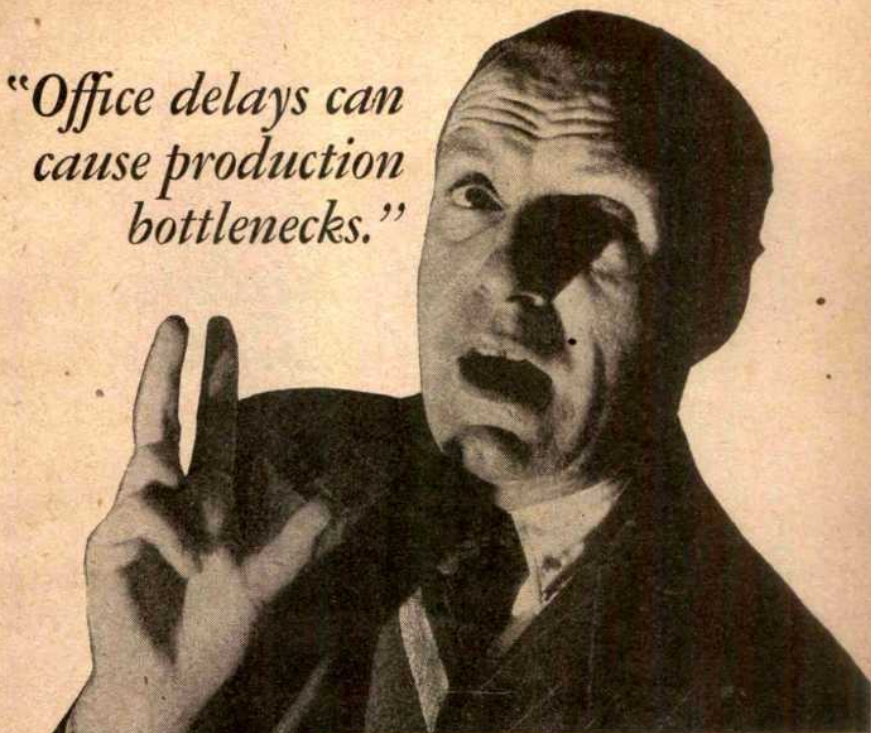
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....present to every industry the most versatile and economical form of motive power, a remarkable development of the world-famous DOWTY hydraulic equipment for aircraft.

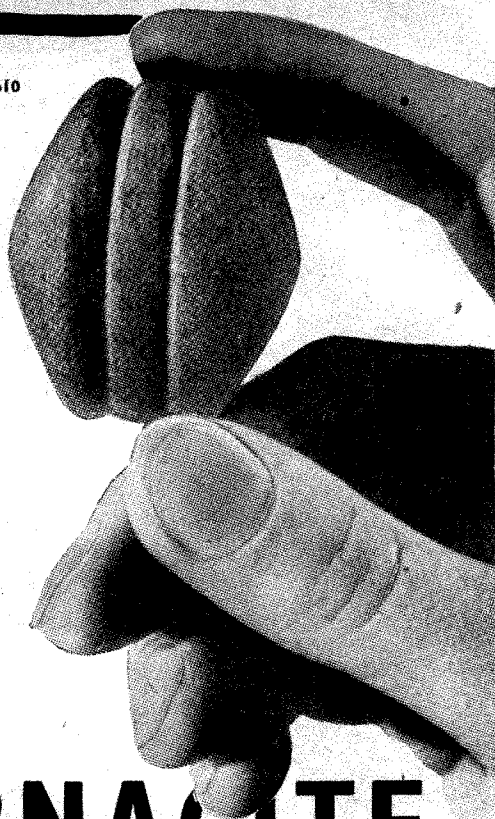
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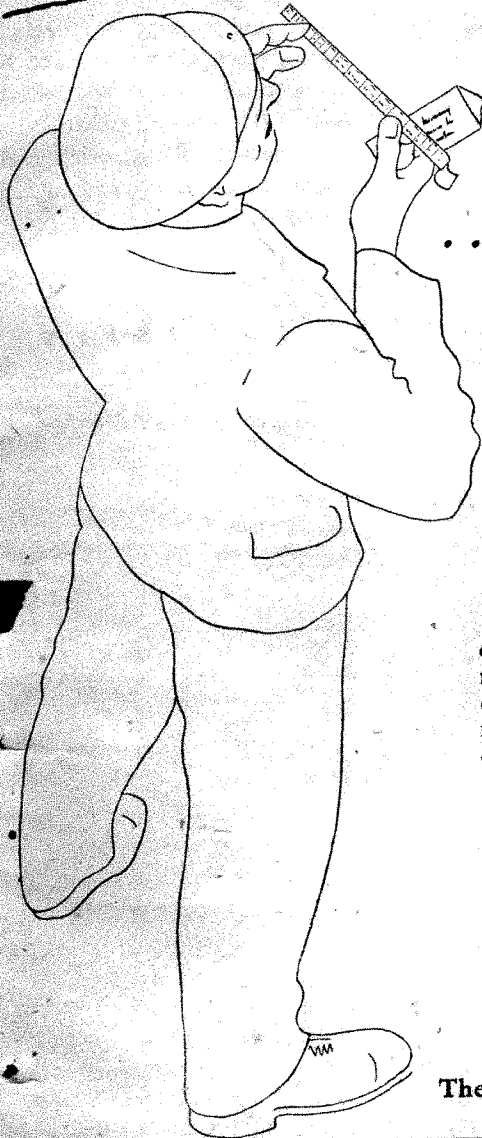
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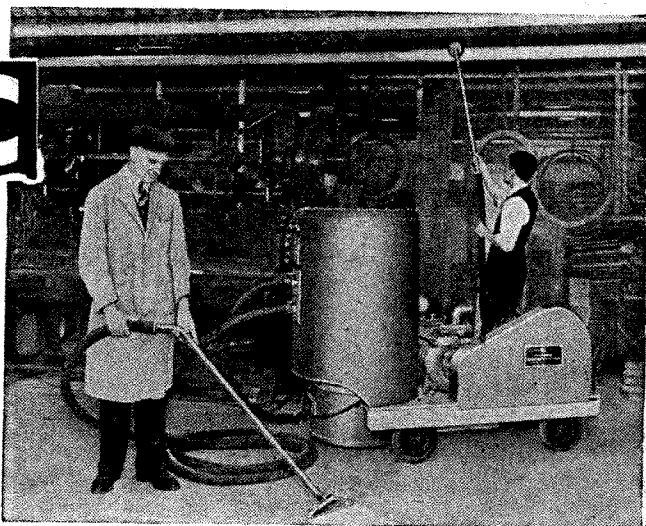
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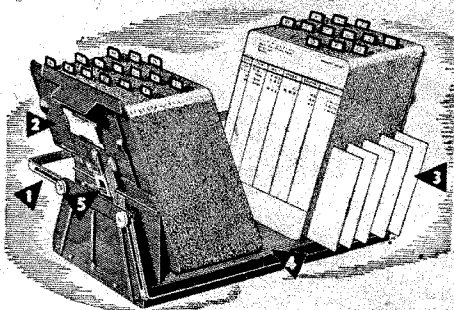
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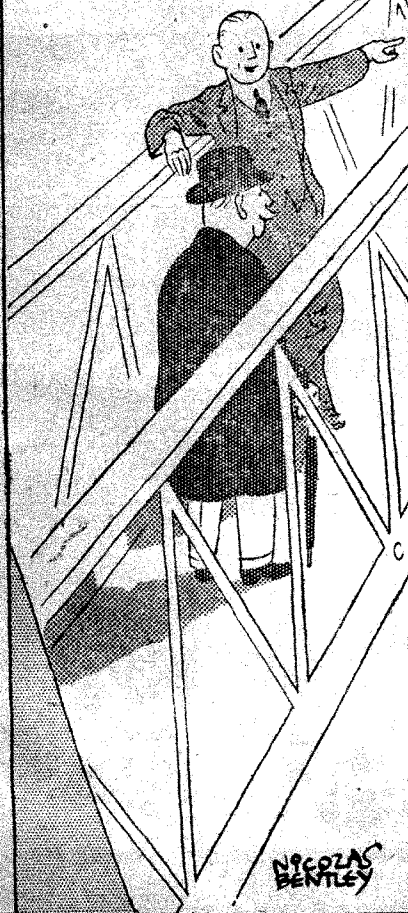
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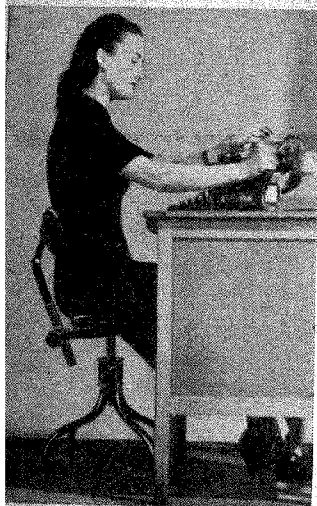
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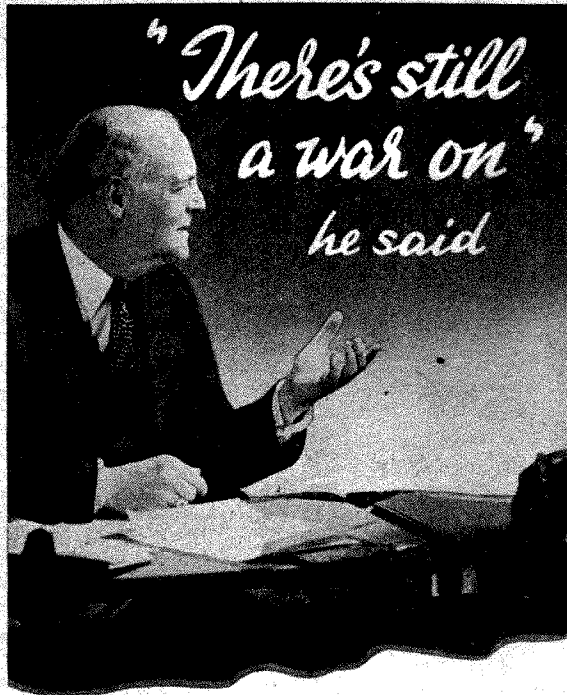
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"There's still a war on," he said. "A war on all the time — against a thousand-and-one things; and, not least of all, against the natural laziness of man which tends to leave things to chance and let them take their course."

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I'm afraid I looked at him rather blankly.

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A clever analogy, I thought; and I'll tell you that, by the time that fellow had finished talking, he'd made me think quite a lot . . .

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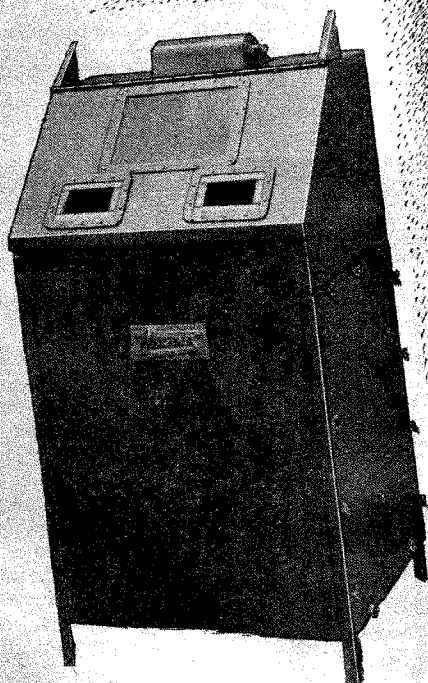


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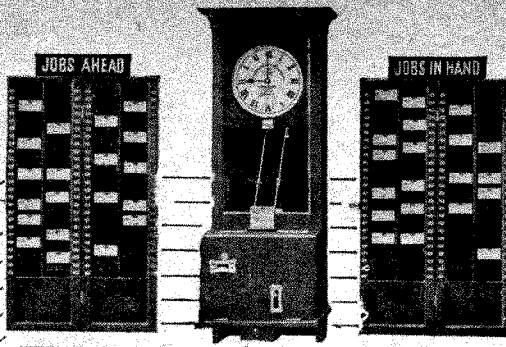
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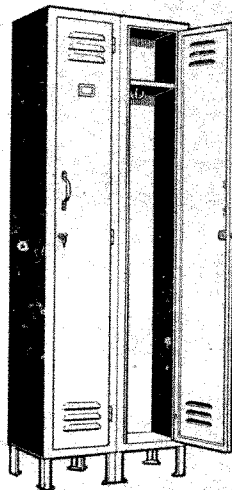


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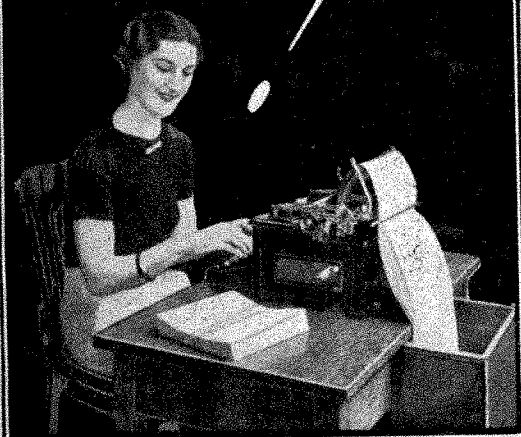
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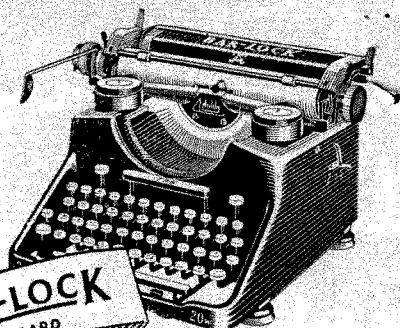
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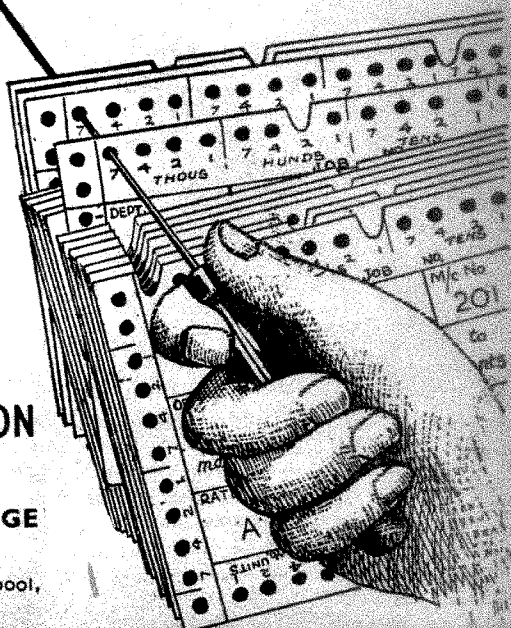
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1946

BUSINESS wishes success to your business and all your enterprise. We hope to help by opening our programme for the year by stating your needs from Government. By dissecting the American Loan. By interpreting Bretton Woods.

AND every Industrialist wants to know what part he plays in the great effort to step up P.M.H. The Editors deplore present indifference and inefficiency. Four leading men of Business and Affairs set forth four distinct programmes to achieve maximum output.

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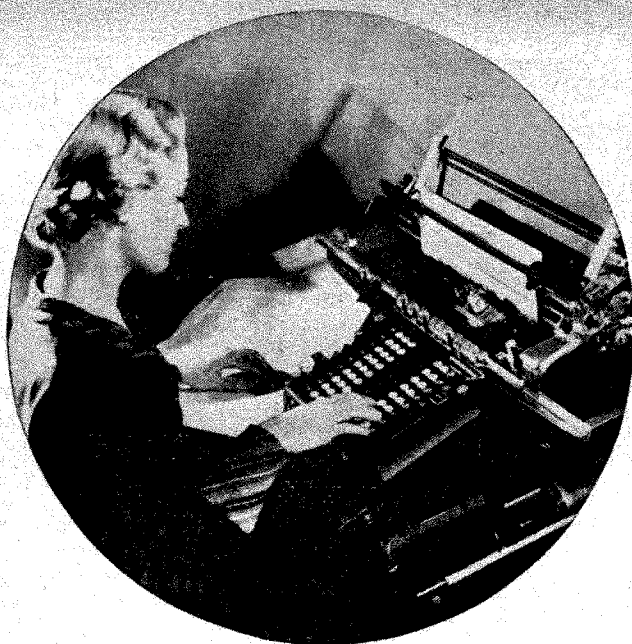
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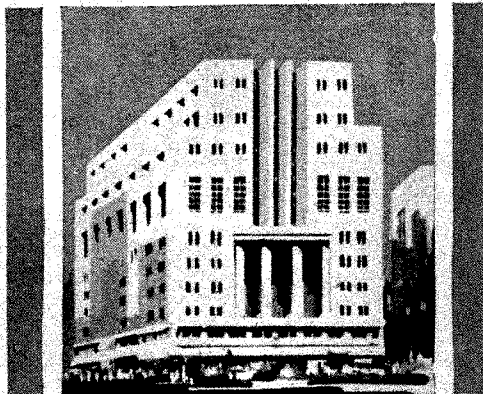
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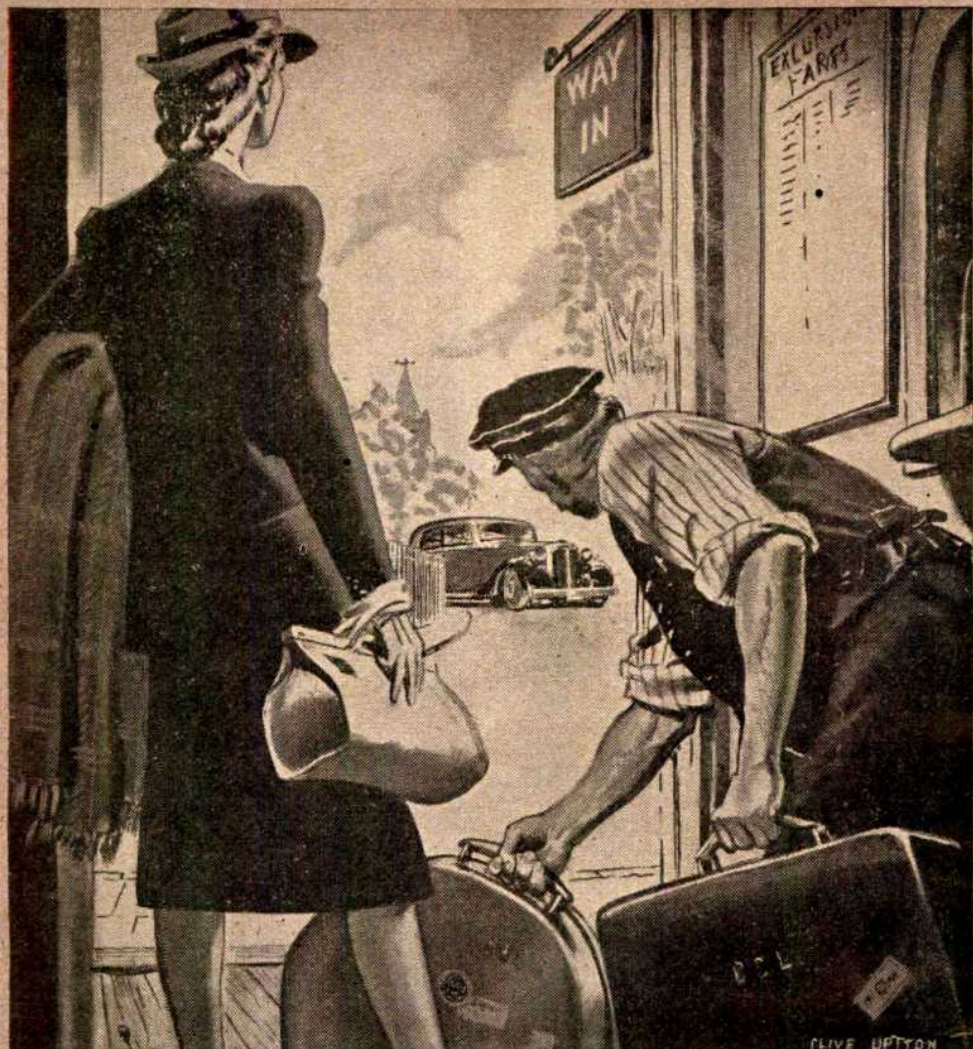
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What Business Wants in 1946

By CECIL CHISHOLM

A WAVE of anxiety is passing over British industry. It would be as foolish to deny this as to exaggerate it. After all, the facts are not exhilarating. Apart from disappointment at the relatively slow rate of demobilization, at the relative rapid rate of nationalisation, come the terms of the American loan.

These terms are shocking, even to the tolerant *Manchester Guardian*. They unpleasantly recall the terms of the German loan of 1919. They mean that another £35 million will have to be found annually after 1951 to service this debt; a legacy our children and theirs may inherit until the dawn of another century.

While these onerous terms from a saved ally give a bitter tang to the atmosphere, the real causes of complaint are nearer to hand. The average business man is prepared to accept a duly elected Labour Government and to co-operate on the policies that Parliament lays down. He is even pleased to find that demobilization is being speeded up as the result of his protests and complaints.

What defeats him is the present uncertainty as to the future. Which industries are to be nationalised and when? Which industries are to have Working Parties and when? When is

fixed? When is a national policy on wages to be laid down, which will end the present vicious spiral. If the latest statement of the Minister of Labour means anything—we need expect no such policy. How far are interest rates to be allowed to fall and when?

It is this mist of uncertainty that at once irritates and intimidates the man of affairs who should be making decisions and getting action.

Yet the Government could very easily banish a great deal of the present uncertainty. I suggest the following steps be considered.

Let us take the larger issues first. The Government has already nationalised the Bank of England and commenced work on the nationalisation of the mines, air-transport, wireless and cables; at the same time planning that of the railways, road transport and presumably gas, electricity and water. Why not announce now the names of any further industries to be nationalised during the life of the present Government? Then other industries would know that they at least would have five years of freedom for individual effort before them.

Sir Stafford Cripps has already announced Working Parties for cotton, hosiery, boots and shoes, furniture and pottery, jute and linoleum. What about the rest of the country? Surely it

would be possible to announce a list of industries scheduled for Working Parties during the next two years. No doubt such a list already exists. Without this information, the majority of business men feel themselves at sea.

Unwittingly no doubt, Sir Stafford is apt to rub salt into the wound. One night he tells the Commons that the publishing industry will have a Working Party. Next day we are told it was merely his little joke. Then we are told, "In this Government's lifetime, if Sir Stafford remains at the Board of Trade." Which is it?

The publishing industry is uncertain about its position. It is not clear even to which branch of the industry—books, periodicals or newspapers—Sir Stafford referred!

Now a Working Party constitutes an entirely new form of control hitherto little experienced in this country. By simply announcing his intentions as to the use of Working Parties, Sir Stafford can enormously relieve the minds of thousands of heads of businesses who really are concerned as to the future of their industry.

Whither and When?

After all the Government wants enterprise and initiative from the free industries. Surely it is reasonable to assure each of its degree of freedom at the earliest possible moment. This policy would, I am confident, reap the Government an untold harvest of goodwill and co-operation.

The same thing applies to interest rates. Mr. Hugh Dalton has just completed the strategic pattern by which interest rates have been reduced another $\frac{1}{2}\%$. How often is the process to be repeated and when? Admittedly much depends on the trend of markets and the amount of money available. But surely it is possible to forecast these over the next couple of years with a reasonable certainty. A clear statement on the Chancellor's intentions as to the level of the rate of interest over the next couple of years would restore much shattered confidence throughout industry.

But the most continuous day-to-day harrassment in business is that of getting licences to permit one to make the simplest moves in business—to buy some raw material, to add to a building, to produce a new product, to sell a few tons of goods abroad. The business man who can do any of these things without being shuttlecocked between at least three ministries is lucky.

Yet three simple steps would clear up the situation. Individual licences should be discontinued in favour of bulk licencing. The granting of licences, which threatens to spread among even more ministries, should be centralised in one licencing department, whether it be at the Board of Trade or Ministry of Supply, now resuming new powers in this direction.

Finally allowance should be made for producing the improved product, the new invention, whether by an old concern or through an entirely new group.

It should be perfectly simple to use the existing Regional Boards, now under the Board of Trade, for preparing the case locally for both new products and new concerns, as well as for a bulk licence to buy material.

In the same way the Regional Boards should take care of the entire preparation of the case and the securing of the necessary licences for new industrial building. This would enormously simplify the problem of the business man who is tired of being butted around by department after department.

Another fact which genuinely worries most responsible executives is the lack of any national wages policy. But despite Mr. Isaac's pronouncement it is vital that two or three first-rate industrialists and economists get together at once to hammer out a practical formula.

Indeed a controlled wages plan is an absolute essential to full employment.

In every industry the calculation of wages should be reduced to one simple single formula, knocking out all the absurd percentages for increases and bonuses that now clutter every wages calculation. Finally the cost of living index can be used to meet future changes in the purchasing power of money.

Needless to say, such an overhaul of wages plans would entail scaling up some of the most poorly paid industries, and probably scaling down some of the most highly paid.

Too Early for Shorter Week

Without a doubt this would cause an infernal lot of trouble in the latter cases. But there is no other way out. The trouble will have to be faced. Some employers are rather apt to forget that the amount of strike trouble to-day amounts to but 8% of that in 1919. At the end of that year we had around 2½ million workers on strike. So we have not done so badly.

It seems to me that the present Government is in a strong position to deal with the wages problem.

One more decision is needed quickly. If we are to meet our debt and tax obligations, British industry must be keyed up to produce a far higher output than it has ever attempted before. To do this the 40-hour week programme of the T.U.C. will have to be postponed for at least five years. Cannot the Government induce the T.U.C. to face the music? Until they do every business chief has a very real grievance. For the real objective of the 40-hour week is not so much leisure, as more overtime money. It is



Means Production per Man Hour

We Must Step It UP — OR . . .

Four Leading Industrialists Talk to THE EDITOR

BECAUSE the well-being of every individual in this country depends upon it, P.M.H. will be the subject of many BUSINESS editorials throughout 1946.

We shall start as we intend to continue, by giving the views and the techniques of the most progressive leaders of British industry. Confidently they sign their names to this article. Others there are whose appreciation of P.M.H. is nil and their views are not worth a rap, but we will take the lid off and cite without fear or favour, those glaring classical cases of ignorance or indifference with which we meet all too frequently in our editorial tours.

This month, Sir Stanford Cooper, General Manager of Ford Motors, Mr. W. C. Devereux Managing Director of Almin Ltd., Mr. H. R. Backhouse, Managing Director of Mellor Bromley & Co. Ltd., and Ian Mikardo, M.P., Industrial Consultant, men in the forefront of industrial

and public life, who appreciate the value of P.M.H. and put into practice their strongly held beliefs, have prepared and put forward for your consideration, their plans for a management/worker combined operations attack on the P.M.H. problem.

Generally speaking, British industry stands indicted. It is accused of parsimony, traditionalism and restrictive practice. Is this the truth? Anyhow, here is the first instance of apathetic ignorance.

"If the Government . . . If controls were removed . . ." This was the plaint of a Midland's industrialist to whom we were talking the other day.

"Given all this freedom," we asked him "What would you do?" "Get down to it," he said. "I have orders to keep me going for the next 18 months." He was sure he could get the labour and the materials too. "You

STRAIT HITTING BY —

would manage to complete your contracts within 18 months then?" he was asked. "And how do you stand for plant?" was our next question. "It will see me through."

Now note that answer. He was talking about machines that even in 1939 were outdated and worn out. For six years they had run day and night, overloaded with war contracts. No doubt this man describes himself as an industrialist. He may be, but he is no business man. His machines would see him through. Will yours, after six years of war? If you consider that they will, then P.M.H. means very little to you either.

Industry stands indicted. Listen to this, from a pro-British American business man. "The British got into a jam because they did not know how far behind they are industrially. And the industrial leaders are taking care that the British Government and the British public shall not find out; those fine British men, women and children—they compel admiration. They deserve a better fate."

Surely a scathing denunciation. We shall see how true it is and what methods we can employ to remedy the position.

Have We a National Par?

Over the whole picture, that is to say, 97 per cent of it (small firms employing less than a thousand workers), there is a failure to recognise the importance of industrial research although there is a changing attitude of mind observable in this respect to-day. There is too little appreciation of the value of science and scientific management. There is only a half-hearted attempt to solve the problem of works relations. There is too much "make-do and mend" in plant maintenance and not enough plant renewal policy. Clerical work is usually top-heavy and little attention is paid to economy of motion, not only on the production floor but in the office. Queen Topsy seems to rule the little industrialist's roost. There are many other failings too, which will be seen as we proceed.

These are not new, blinding discoveries, but the keen scalpel of war has rudely exposed this country's industrial morbidity for what it is. Hence, the appreciation in progressive quarters of the urgent necessity to step up out-put per man. In America, industrial records have proved that out-put per man increases at an approximate rate of 50 per cent every 10 years. This National Industrial Par is the basis of U.S. industrial leadership.

Elimination of waste, plus improved production techniques, plus the most modern machine tools are the controlling forces that increase P.M.H. and cut production costs. The American industrialist generally allows that at least 10 per cent of the total machine tool investment should be set aside annually for tool re-

placement to enable the firm to attain or excel the National Industrial Par.

There are, of course, strong industries capable of holding their own against all comers, among them is British ship-building, shipping, railways, woollen manufacture, chemicals, soaps, processed foods, leather and furs. Among the big industries, weak in P.M.H. and incapable of holding their own in a competitive world, are British coal, motors and steel.

Efficiency is not absolute, it is relative, and if we use America as our yardstick, we find that in one hour, the average workman in America produces over twice as much wealth as the average British workman. The American "edge" in the elimination of non-productive workers is still more striking. In U.S. plants, 25 non-productive workers (supervisors, clerks, etc.) are employed for every 100 productive workers. For the same job in Britain, we employ 90 non-productive workers. Naturally, the results of such inefficiency show up in costs.

Then there is the important question of the relationship between management and worker. To step up P.M.H. in many organisations, will mean the adoption and application of revolutionary techniques in management and in the introduction of machines which at first glance dispose of immediate labour. Many workers suspect new production methods. Unemployment has made them slump-conscious. But it is just to prevent the danger of slumps that they need to become production-minded.

British executives visiting America are often baffled by the familiarity between management and operator existing in U.S. plants and firms. We tend to be more formal and rigid at the top whilst at a lower level even craftsmanship tends to set one group of workers apart from the others. This group-consciousness creates a variety of production restrictions. These must be swept away.

On the part of management, there is unwillingness to scrap old and to invest in new machinery and in the American view, Britain lags behind in its willingness to make new bottles for new and heady wine of this mass production age.

Mr. Devereux believes that the problem of P.M.H. is one of quantity plus quality. At the back of his mind there was that fear of apathy of which we have already spoken, when he said:

"After all the talk of the past year, the subject of P.M.H. seems to have entered a closed season. With millions standing idle awaiting demobilisation and thousands more sitting beside their machines awaiting licences to manufacture obvious necessities, the old bogey unemployment is beginning to enter the minds of many and with it the attendant thoughts of 'Featherbedding' and restrictive practices."

This is a corrosive atmosphere, says Mr. Devereux, and the work of the apostles of increased productivity in recent years will be undone unless the interest of the public is stimu-

W. C. DEVEREUX **SIR STANFORD-COOPER** **H. R. BACKHOUSE** **IAN MIKARDO**
Managing Director, *General Manager,* *Managing Director,* *M.P.,*
Almin Ltd. *Ford Motors* *Mellor Bromley & Co. Ltd.* *Industrial Consultant*

lated. The "raging blaring campaign" for increased productivity in the later war years has not materialised and public interest in the subject is flagging as the months go by.

"The people are not being given any pictures of the sort of things which increased productivity will bring. There is no talk of rewards for work well done, only gloomy threats of penalties for doing the wrong things and even these are given piecemeal in the form of wide generalities lacking the impressive background of readily understandable facts and figures."

Something must take the war effort's place as an incentive to production of international needs. We have still a long way to go before service to the community becomes a practical incentive capable of securing the maximum contribution from every worker.

"During the war, we have seen that this motive, when emphasised by real and dramatic events, can produce remarkable spurts in productivity but we have yet to find the means of using it to achieve a sustained effort in peacetime."

Mr. Devereux considers that for the time being we must content ourselves with more direct incentives, for even the well tried and hitherto successful incentive system of payment by results has lost much of its potency. Reasons for this, he says, are heavy taxation, shortages of goods on which to spend earnings, and a feeling that the hard and tiring years of war have not produced the expected rewards.

"There is a grave danger of apathy and frustration arising from inability to buy the things that are wanted, as wages chase prices up as they will do if wage increases are not matched by increased productivity."

It is obvious that in Mr. Devereux's opinion, incentives must play an important part in P.M.H. But the incentive turned into workers' wages must mean real purchasing power. "A car in every garage," he says, "must be an attainable objective not an ever receding mirage."

Next he discusses the question of leadership, which, he says, is closely related to that of incentives. The complex nature of modern industrial practice necessitates a complex administrative structure and as the successful enterprise grows, the competent men who have built it are forced to delegate more and more of their authority.

"They are greatly handicapped in this by difficulty in finding sufficient numbers of managers and foremen in whom are combined the necessary qualities of leadership and executive and technical ability. The manager is often less enlightened in his attitude than the General Manager, the superintendent less enlightened than the foreman and so on down the scale. Thus management's first problem is often encountered at the lower fringes of management itself."

responsibility on management for the officers and executives it employs, but as he says, it is also true that it often has very poor material to work upon. A possible solution to the difficulty, would be to recruit specially trained cadets for management. The snag here, however, would lie in the reduction of opportunities for promotion from within the ranks of the organisation, so eliminating a most valuable incentive and in the end much valuable experience which the present system of promotion makes available, would be lost.

"The solution here," he says, "lies in the development of scientific methods of selection and training for management."

But whilst so much attention must necessarily be given to the problems of management, it is imperative that a wary eye is kept on technical progress.

"I believe," continues Mr. Devereux, "that no manufacturing company, however small, will be able to go far into the future without carrying on some research on its own account in order to keep ahead in the race for increased efficiency and economy."

The Price of Indifference

Here he stresses that every business executive must find time to follow the latest scientific discoveries which may effect his business and he must discuss with his scientific advisors ways and means of applying these discoveries to improve the efficiency of his manufacturing processes. Only by the rapid application of new developments can the tempo of progress be maintained, and efficiency be kept at a point where the enterprise is a success.

As we write this, support for Mr. Devereux's argument reaches us via the Conference of the British Association discussing "Science and Industrial Planning." Sir Arthur Fleming of Metro-Vick believes that to a large proportion of our industrialists, research on which their efficiency depends, is only a word. Quoting our figure of 97 per cent as representing the small British firm in the whole industrial set-up, he noted the difficulty these organisations experience in meeting the cost of industrial research.

The Research Associations which are aided by the Government can help these firms but the growing need for every manufacturing concern was for the appointment of a scientific officer to assimilate the new advances of science.

Backing up Sir Arthur, Professor M. L. Oliphant attacked British industrial shortsightedness when he revealed that the atom research equipment of the Cavendish Laboratory had to be got from Holland because British firms were not interested." So far the indictment still stands.

Mr. F. E. Smith of Imperial Chemicals gave an example of the effect of research at a min-

cent was raised and spent on research. Over a period of 8 years, this research led to a reduction in the cost of raising the mineral by 15 per cent and increased out-put per man by 90 per cent—a specific lesson in what research can do.

BUSINESS readers know Sir Stanford Cooper. Recently, we presented a cameo of his business career and the methods he employs. Managing Director of Ford Motors, there can be no doubt as to his views on P.M.H.; and Henry Ford, mass production and P.M.H. are virtually synonyms. Perhaps Sir Stanford, conditioned to American ideas, takes the replacement of plant and the value of research for granted; perhaps not. But P.M.H. to him is essentially a human problem and the answer he says is good labour relations.

"The present mass political psychology need not necessarily cloud and prevent good employer-employee relationships. Individual firms, more than ever, should show leadership in their own spheres. The fundamental objective should be the creation in the minds of workers of a sense of fairness and concern for their good. To achieve this the following specific policies must be adopted:—

1. Payment of a reasonable basic wage to all workers. This is a minimum human requirement.

2. Additional merit payments according to individual effort or ability. Encourage the initiative and enterprise of each worker by rewarding him appropriately for good results. Providing a worker produces well, the size of his wage packet should not be considered. The unit cost of production is the only matter which should concern management. Every effort should be made to revive this sense of individuality.

3. Provide in works relations a safety valve to deal humanly with seemingly little problems. Let each worker feel that he can raise individual complaints with the Welfare or Employment Manager and also let it be known that the Management is interested and will do all it can to make working conditions agreeable.

4. A warm, well ventilated and light building should be provided to work in—make the amenities as good as possible. Keep the factory clean and tidy.

5. Provide efficient plant and equipment. Let the workers realise that Management has done its part by installing good "tools for the job."

6. Management at every level should set a good example by working hard and efficiently.

7. Adopt the policy of "fair prices" to the community. While workers are mostly concerned with what they get for their work and effort, they are nowadays influenced by wider considerations. Adopt the "vicious spiral in reverse" as a major policy and let it be known.

8. Encourage a healthy team or family spirit. Make workers feel a little proud to be members of the organisation.

"These," concludes Sir Stanford, "are the 8 keys upon which I should endeavour to play my tune—harmonies are possible also."

Next we pass on to our interview with Mr. Backhouse, Managing Director of Mellor Brothers & Co. Ltd. Sir Stanford Cooper and



Photo—courtesy Daily Herald.

Ian Mikardo, M.P.

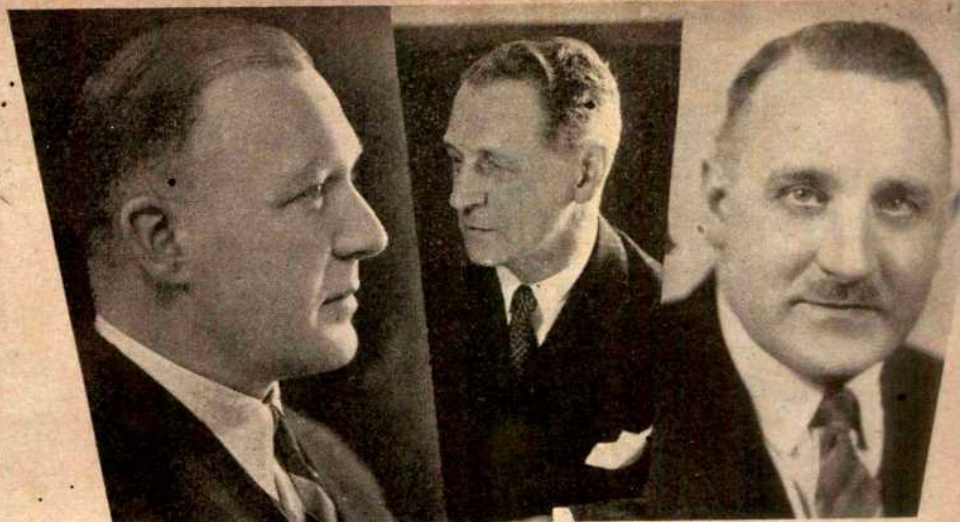
Mr. Devereux produce the goods the consumer uses, but because there is truth in the saying that horsepower per head equals wealth per head, Mr. Backhouse's attitude to P.M.H. is of primary concern to every industrialist, for his firm makes the machines that make the goods. And yet in the making of those machines, he must apply research and couple it with the very latest in equipment and the most modern ideas in management. The solution of P.M.H. to the engineering industry, especially in this branch, is vital to every producer industry. If the plant making industry runs on haphazardly laid rails, other industries will suffer.

Three Specific Techniques

Again the plant makers, by very virtue of this position, should set the example. They should by their methods, by the machines they use and how they use them, the tools and accessories they provide, and in their administration, be a model in the technique of raising production per man hour.

"For these reasons, P.M.H. is to us a very big question," said Mr. Backhouse. "More production per man hour is exactly what we are striving for and if you ask me how we can get the most from management and men, I reply 'By the use of three specific techniques'. Broadly, here they are. First, pre-preparation of all the work, in all its stages, involved in the course of actual production. This includes an analysis of the needs of every section of the factory concerned in the actual manufacture of your product.

"The second technique covers the actual production operation itself. First, the orders must be scientifically surveyed, management must ensure that the right machine tools, the tools



H. R. Backhouse — Sir Stanford-Cooper — W. C. Devereux

and the complete accessories are actually on the production floor. Then the run sequences should be planned.

"Finally, but still broadly, the third technique involves the question of labour itself. For our part, we have gained in this respect from a rich and profitable wartime experience. Things we suspected pre-war, events have shown to be true; the truth that there is one job that one man or woman does better than any other. To find that job and to find the right man or woman can be one of the soundest methods of giving industry the increased output it desires and the worker the satisfaction of doing a worthwhile job.

"Selection, scientific selection of the most suitable type of operator, is more than half of the personnel problem. It is sound policy to select your workpeople as far as this is possible in accordance, not only with their seeming skill, but according to their bent. If, in the midst of the stress of war, when we in this firm along with our co-industrialists in other spheres, could not afford to be too discriminating but withal stepped up our production by means of rough and ready wartime selection methods, it is obvious that with more care a great deal of headway could be made in fitting in the right worker to the right job.

"There is also the question of physical fitness. In wartime too, even under employee direction, we insisted upon a medical examination of all prospective operators. Physical qualifications were placed alongside adaptability, skill and application with profitable results to output.

"Why should we not then, maintain this policy which has proved its soundness in providing us, in the most stringent and trying times, with workers of skill and enthusiasm? Both attributes which were but a reflection of their physical well-being. A fit worker is a productive worker. If he or she is not, then there must be a reason. For production per man hour, every factory's

unit must be sure that it is getting the full weight of every worker behind the wheel of production.

"So much for the broad analysis of the techniques which, if properly applied, will go towards stepping up P.M.H. But an analysis of each is needed to amplify one or two specific methods of applying them.

"With regard to pre-preparation; here it should be born in mind that pre-preparation must go rather further back than the acceptance of orders, their analysis and production planning. First of all comes the important subject of design. Top management has a duty to see that the designer is not led away by idealistic enthusiasm.

"It must be constantly kept in the forefront of the designer's mind that his ideas must ultimately reach the stage at which practical problems of production arise. The unit he conceives, the shape of the 'mock-up', is something more than a fanciful streamlined edition to the planning engineer.

"His design must be practical not only in functional use so far as the consumer is concerned, but must be practical from the engineer's viewpoint as well.

"Then there is another important feature in the detail of pre-preparation, namely the use of time-saving jigs and tools. Only too often does the practical planning engineer and works manager see production time being lost all round him whilst fitters and assemblers, setters and supervisors, hunt around for missing bits and pieces.

"Our machine tool and jig policy stipulates that as far as possible, jigs must be designed without loose parts. Every single component of the jig must be an actual part of it, and the assembly of jigs as far as possible should be effected by means of interlocking quick-operation cams snapped into position. A sharp knock with a hammer locks the parts securely together.

"Care of machine tools also contributes greatly to a constant pitch of mechanical efficiency. It is bad economy as far as P.M.H. goes, to work with a skeleton service and maintenance staff. There are of course methods of maintaining plant. Except in the case of heavy machinery, it is generally the custom to carry out maintenance repairs on the production floor.

For our part we think it a sounder policy to insist that the machine be taken out of the shop and transferred to the maintenance repair department. Repairs to adjacent machinery are a distraction to the best operator. Strange workers dodging in and out impede the smooth running of any production department. Production per man hour can be made interesting even although it demands a higher degree of concentration. Repair work is a distraction and the enemy of concentration. It is also a waste of floor space. Shop gangways get cluttered up with maintenance trolleys and parts of machinery. Production trucks frequently have to be diverted and again valuable minutes are lost and the production flow and schedules are upset.

Old Machines Cost Money

"Nor can managements afford to use old machine tools. Obsolete plant is the menace of production and to persist in using it displays a wasteful mentality on the part of management. A rigorous policy of scrapping and replacement—and replacement with the best and most modern of equipment, is the one way to ensure that as far as your machines are concerned, P.M.H. will not be impeded.

"It is a good idea to appoint a qualified senior executive to the charge of works and quality engineering. His duties should be to seek out from every position, sources of information with regard to the development of tools and to bring before the management, after consultation with the production engineer, periodic reports on the trend of machine and machine tool development. Decisions are exactly a question of figures. Will the new machine give better speeds and feeds? If, for example, a machine tool costing £5,000 saves £5,000 in two years operating, then this machine is worth installing.

"But men and women wear out and also need repair and maintenance. Progressive managements admit that the days of the human scrap-heap mentality are over, and like everything else, manpower must be conserved. After all, we are discussing production per man hour and not production per machine hour. P.M.H. might mean the same. It should not be forgotten that the 'M' is for man and not for machines. Progressive managements realise that the works' medical officer can no longer be regarded as a luxury. They realise too that conditions of work must be good, not merely by way of inducement to steady recruitment to industry, but simply because, as I have already said, the fit worker is the productive worker.

"Periodic overhaul by the works' medical officer can be one of the most important contributing factors to P.M.H. Here is proof of that. Suppose the supervisor of a battery of

drills in the machine shop notices a falling away in output on a certain drill section. The job card reveals long runs on the same component; time study has directed the potential output; the bonus columns in the wage analysis sheet shows that the time study is fair. Rating, wages and bonuses have been constant, say for six months. Then suddenly, output declines, why? The supervisor reports exemplary behaviour and application to the job on the part of the operator.

How Welfare Helps

"Here is a specific problem for P.M.H. The machine is right, the tools are right, the materials are right. The seemingly good operator remains and this is where the industrial medical officer makes a vital contribution to the solution of the P.M.H. problem.

"In the case cited, he discovered the trouble. The operator was drilling fine parts, working long and efficiently on a tricky job; the high standard of work had been sustained over a period of six months and her eyes were tiring progressively. That the tiredness was progressive was evident in an analysis of her work. Her production was falling off a little earlier each day, caused by a falling off in eye-sight efficiency after a night's rest. In her effort to sustain her reputation for output, percentages of rejects had increased.

"Tactfully handled between them, the personnel officer and the medical officer solved the problem by arranging a temporary transfer to work which was less exacting in the optical sense.

"Yes, I am convinced that experience here shows that with a wise co-ordination of these three policies, at least as far as our organisation is concerned, production per man hour can be increased with profit to the nation as a whole, to the firm and to its management and workers."

And finally for the views of the industrial consultant who is also at the same time a Member of Parliament and a Trade Unionist. You will not find in his case advocacy of those practices which restrict the craftsman's output, nor is there any defence of that group consciousness which also bottle-necks production.

He obviously believes the burden on productive costs caused by too much paper work and too many non-productive workers must be removed for he spotlights the necessity to streamline ancillary office operations.

"There is no doubt," says Mr. Mikardo, "that the prospects of an immediate and sharp increase in our industrial efficiency lie first of all in the improvement of our standards of management. There are still too many businesses in this country which do not recognise that management is an art in itself, and that it demands a knowledge of techniques which are common to all industries and different from those involved in the actual manufacturing processes of any particular industry.

Business Digests the Facts

1. This is the American Agreement—

THE starting-point for consideration of the loan from the United States to Britain, just agreed, is Britain's shortage of dollars (or corresponding gold) and the impossibility of any other than a gradual expansion of exports.

The purpose, therefore, of the "line of credit" of \$3,750,000,000 which this country may draw upon, between notification that the United States Congress has made the funds available and 31st December, 1951, is to facilitate British purchases of United States goods and services, to help tide this country over post-war deficits in its international trade balance, and to assist Britain in assuming the obligations of multi-lateral trade.

Associated with the loan is the "final settlement of the financial claims of each government against the other arising out of the conduct of the war." In a monetary sense, this will close the whole chapter of Lend-Lease and Reciprocal Aid, at a net final cost to Britain of \$650,000,000, subject to adjustments of an accounting character as may be found necessary.

Thus the total British liability may be an aggregate of \$4,400,000,000 (say £1,100,000,000 at the present exchange rate of \$4.03 to the pound sterling). Britain undertakes to repay this, beginning on 31st December, 1951, by fifty annual instalments, with interest at 2 per cent. In effect, a cumulative sinking fund will operate, with a slight final deviation, in that 49 instalments will be at the rate of \$31,823,000 in respect of each \$1,000,000,000 of debt (to cover principal and interest) while the fiftieth will be at the rate of \$31,840,736.65. This will involve Britain in annual payments of about £35,000,000 sterling.

In the future, Britain may again find itself short of dollars and the agreement makes provision for waiver of the amount of interest (but not principal) due in any year, subject to fulfilment of two conditions. Britain must find it necessary "in view of the present and prospective conditions of international exchange and the level of its gold and foreign exchange reserves". In essence, this relates the question to the state of British export trade. The second condition is that the International Monetary Fund (established under the Bretton Woods Plan) shall certify that British external income, from visible and "invisible" exports averaged over the preceding five calendar years (or from 1950 if less than five) was less than the 1936-38 average of imports, put at £866,000,000 and to be adjusted for changes in the price level of the imports.

Intended basis of settlement is that part will be released at once and be freely convertible for current transactions, part will be released over a period beginning 1951 and part will be "adjusted as a contribution to the settlement of war and post-war indebtedness."

Finally, it is intended that within a year from the agreement becoming effective, the "dollar pool" of the sterling area shall be dissolved so that current sterling and dollar receipts of members will be at their free disposal, and generally speaking, sterling and dollars will become freely convertible. This one-year provision cuts down the three-to-five-year term contemplated by the Bretton Woods plan for the abolition of exchange restrictions, although the present agreement provides for discussions, if desired, with a view to modification.

2. Bretton Woods Means THIS—

THE plan evolved by the United Nations Monetary and Financial Conference at Bretton Woods in July, 1944, fell into two parts. It provided for the establishment of an International Monetary Fund and for an International Bank for Reconstruction and Development.

Each member was assigned a quota, that of the United States being \$2,750,000,000, the United Kingdom \$1,300,000,000 and (including the latter) the British Empire about \$2,350,000,000. Adherence by 31st December, 1945, of 65 per cent of the quotas makes the plan effective. The quotas are to be paid in full, partly in gold and partly in the currency of the member, thus giving the Fund resources out of which, subject to certain limitations, a member could purchase, in exchange for its own currency, that of another member in order to correct temporary maladjustments of its balance of payments. It is hoped thereby to avoid deflation.

The currency of each member is to have its parity expressed in terms of gold or of U.S.

dollars. Each member has to undertake to collaborate with the Fund to promote exchange stability and to avoid discriminatory practices and exchange restrictions, except in the case of a currency in such short supply that the Fund shall have made a formal declaration that it is a "scarce" currency, when any one member may take action after consultation with the Fund.

Initially parities are subject to discussion, but once fixed—that of the pound is to be 4.03 dollars—variations may only be made to correct "a fundamental disequilibrium". The Fund must be notified, but up to 10 per cent of the initial rate, may raise no objection. Up to a further 10 per cent, the Fund may concur or object but on request must decide within 72 hours while above the latter limit the Fund must have longer for consideration.

A member may withdraw from the Fund at any time on giving notice or may be suspended from benefit for failure to fulfil its obligations or expulsion for persistent offence.

What Britain Wants in 1946

Continued from page 34

unreasonable to ask management to produce both more leisure and more overtime money for the sheltered workers while it is straining to reduce the cost of every unit of production in the unsheltered industries.

By how much can the output of British industry be increased within the next few years? Dr. Barna has shown that it might be increased by as much as 20% in average output per head in the heavy construction and export industries, coupled with a rise of 10% in consumer industries, if *and only if*, 4 million people were employed in the heavy construction industries and 11.5 million people in the consumer industries. Such a rise in productivity would meet the needs of both the export and investment industries and would enable a rise of 5% in consumption. The difficulty, be it remembered, is that so much must be spent in new plant and equipment and in housing during the next 10 years.

Sir Stafford Cripps has done a great deal to impress industry with the need for more modern equipment. But as the article on page 35 shows, a great deal remains to be done. While

some of the new industries are output-conscious, many of the older ones are not.

Yet for the next 20 years the future standard of living in this country is going to depend almost completely on P.M.H. Only by producing far more goods per head shall we have enough of the good things of life at home, since so great a part of our output must be sold abroad to get dollars and pesos to buy food and raw materials.

So far Sir Stafford Cripps has been a voice calling in the wilderness. I suggest that a big national propaganda campaign, by press, radio and film, possibly also a well reasoned advertising campaign in the press, is necessary to make every employer and worker in this country output-conscious.

Such training as T.W.I. is doing a great deal in certain large concerns to convince the workers of the importance of doing the job efficiently. But we require more of this sort of training for both employers and employees.

This journal will do its part by concentrating special attention on the methods of securing better P.M.H. During the next 12 months in every issue we hope we shall be able to print at least one case history.

Meantime can the Government be induced to announce their decisions on the series of matters outlined above in a reasonably short time? If they do, I am convinced that they will find the co-operation of industrialists much more general and much more vigorous.

Sir Stafford !

Its Up to You, To—

1. Issue list of industries to be nationalised during life of this Government.
2. Issue list of industries to have Working Parties during the next two years.
3. Announce intentions on lower interest rates.
4. Discontinue individual licences, make bulk licensing general.
5. Centralise licensing in one department.
6. Allow for producer of improved or new product, even if a new group.
7. Use Regional Boards to prepare case for provincial manufacturer for building, new products, and materials and export licences.
8. Initiate national campaign for P.M.H. to make employers and workers output-conscious.

THE legal profession have a saying that "a public company has no soul." This may be legally and technically true, but there are a number of companies in this country whose policies demonstrate that the men who run them have souls. In this progressive group, any informed observer would put the Dunlop Rubber Company well in the forefront.

After an extraordinarily successful war effort, Dunlop is ready for the tough post-war years with an amazingly comprehensive training and education scheme for its employees, including present workers, returning workers from the Services, and juveniles entering the industry. The Company has determined that the individual ability of its entire personnel in craftsmanship, efficiency, administrative capacity and leadership shall be a model for other British

Management — Worker Harmony SIR CHARLES TENNYSON Backs

where he worked under Rufus Isaacs, later Lord Reading, and Sir John Simon, now Lord Simon, no mean distinction and experience in a period when expanding world trade brought innumerable commercial and constitutional problems to be settled in the capital of the Empire.

In 1911 Sir Charles became Assistant Legal Adviser to the Colonial Office, and held that

When one considers the world-wide commercial and trade problems of the Dunlop organisation on the one hand and the experience and equipment of Sir Charles on the other, it is remarkable how the needs of the first fit in with what the capacity of the second can supply. After an education at Eton and King's College, Cambridge, where he achieved scholastic honours too numerous to list, he was admitted to the bar

Dunlops 6 Point Training Scheme By FRANK PLACHY

industries and the steps it has already taken seem well designed to make that come true.

The Dunlop training and educational programme is a complete fulfilment of a challenge made by Lord Woolton. In a speech on reconstruction made in the House of Lords before the end of the war, when Britain's post-war problems could already be seen as formidable, Lord Woolton said:—

"I believe the great industrialists of the country are going to recognise that here is their opportunity confronting them to rebuild this country. This is not a matter of Party conflict as to whether the industrial organisations should belong to the nation, belong to the municipalities, or belong to private capitalists. I do not care about that so long as these organisations are ready, so that the moment the war is all over these great commercial and industrial forces in the country will say: 'Now that we have, by the grace of God, been preserved from defeat we shall rebuild in this country a land which is worthy of the men who have gone, without whom we should not have had this opportunity.' I believe that the great industrial organisations of this country are going to take up that challenge, and if they do so, then indeed they will have rendered great services to the community."

In accepting this challenge, the directors of Dunlop chose one of the most interesting personalities in British industry to carry it out. He is Sir Charles Tennyson, C.M.G., who has been secretary of Dunlop since 1928. Sir Charles is that oddity which only Britain amongst modern industrial nations can show, a scholar who is also a successful business man.

post until 1919. In 1919 he left the Government service to help organise and become deputy director of the Federation of British Industries, and was immediately plunged into the vortex in which international trade was conducted during the Long Armistice. His active commercial life has not caused any divorce from his intellectual interests and achievements. As might be expected in a grandson of one of the greatest poets England has ever produced, Sir Charles keeps in touch with many artistic activities. He is chairman of the Central Institute of Art and Design and for 25 years has taken deep interest in the question of industrial design. He is a member of the new official Council of Industrial Design.

As in the past, design will fill an important place in Dunlop's post-war activities whether these be connected with tyres, garments, footwear, sports goods or the new lines which the future may bring into prominence.

The initiation of such a large-sized training and educational scheme as that which Sir Charles and his associates at Dunlop are now launching naturally involved many problems. It has always been a Dunlop principle to promote men from within the organisation rather than to look outside when vacancies arise. Because of the war, however, many men connected with Dunlop have been away from two to six years during which both commercial and technical conditions have undergone revolutionary changes. It is also true that many men who in the Forces have undergone rapid and sometimes startling development through their war experiences. These men may be of greatly increased value to the Company, but they will



"The one way to keep a good man down is never to find him." Why search the country for trained men? When these men of the future have finished the course, they know their firm, its policy and its products

require considerable technical and other training before they can be usefully absorbed.

The main object of the scheme is to ensure that the right training is available for each demobilised employee and that, in the interests of the employee as well as the Company, every advantage is taken of the experience and knowledge he has gained during his war service.

The object of the training scheme may be stated under six general heads:—

(a) The re-instatement and training of employees (both staff and operatives) who are returning to the Company's services from the Forces and from Government Departments and who are considered capable of assuming administrative and supervisory responsibility.

(b) The study of the Company's responsibility in relation to the continued education of juveniles in its employ, particularly in connection with the provisions of the new Education Bill. The Company is anticipating the coming into operation of the Government scheme for the continued education of juveniles. This is to be one day a week, but under the law may not come into operation for three or four years. The Company is arranging with local authorities for these juveniles to attend classes one day a week, starting at once. They will be paid for the time spent in school.

The various divisions of the Company are arranging studentship schemes to take the place of the old apprenticeship. These will be for selected juveniles and will aim at producing operatives of the highest skill and men with technical knowledge and general ability to qualify for supervisory and administrative posts.

Special schemes are also being worked out for the initiation of new employees instead of having them posted straight into factories without any prior instruction.

(c) The establishment of specialised training courses for all ranks of the Company's employees in order to discover and develop latent abilities in individuals, to raise the general level of personnel quality and to ensure a steady flow of fully trained men and women right through the organisation to the highest posts.

(d) The implementing and amplification (where necessary) of all Government measures relating to training, re-instatement in industry.

(e) The Company is establishing relations with the leading Universities and has already

established a lectureship in Rubber Technology in the University of Birmingham.

(f) The maintenance of a Central Register of employees which will facilitate the interchange of staff between various divisions of the Company's vast world organisation and so make it possible for a particularly promising individual to transfer to another division if opportunities for promotion in his own division are not immediately available.

Schemes Vary with Needs

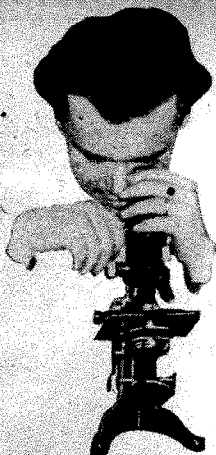
In such a large organisation, dealing with thousands of employees, it has been necessary to work out many different training schemes to suit particular needs. These have all been arranged, but are too lengthy for detailed description here. For instance, the General Training Course in the Home Tyre Sales Division, designed for the 18-24 age group, extends over 16½ weeks and admittance is conditional upon successful passing of previous elementary training schemes. The Advanced Training Course lasts 35 weeks and is much more rigorous. As this is intended only for those who are likely to rise to senior executive and administrative rank, it calls for a very careful selection of students, but on the other hand it is a mark at which all ambitious and earnest men may aim.

These training schemes at Dunlop have been given a great deal of serious thought during the past two years. They are based on a philosophy of worker-employer relationship which differs profoundly from the attitude of the past. Although Dunlop has always considered itself in the van amongst enlightened and forward-looking employers, the future plans which Sir Charles Tennyson and his committee have the responsibility for working out recognise the fact that an entirely new workers' psychology is abroad in Britain.

Sir Charles argues that education properly directed cannot help disproving the current political tenet that there is "conflict of interests" between industry and the workers to whom it gives a livelihood. Here the Company's past record stands as good evidence; Dunlop has always been an industrial democracy where there was always room at the top of the ladder.

Please turn to page 122

LOOK-OUT *for* NEW IDEAS



● New Rubber Liners.

—The biggest tank lining job in its history was carried out by one of Britain's tyre and rubber companies for the production of material needed for the atomic bomb. Five tanks, each weighing 65,000

pounds, were sheathed with rubber by a special process discovered by the firm.

● **Hermetic Packages.**—Rare tropical fruits can now reach this country in the same condition as when they were picked, thanks to a new wrapping which is impervious to moisture, but permeable to carbon dioxide gas, thus allowing the fruit to "breathe."

● **Universal Loom.**—A shuttleless loom that can weave even rope or wire has been invented by a Yorkshire textile manufacturer. The loom is said to cut out accidents caused by flying shuttles, runs silently, and is worked more easily than the ordinary loom.

● **Stations to Order.**—A British railway company is giving the highest priority to the building of a number of prefabricated stations to serve new development areas and replace bomb-damaged and obsolete stations. The stations will be built complete from platforms to booking offices.

● **All-seeing Eye.**—A pick-up "eye", 100 times more sensitive than any previously used, enables television to do a 24-hour coverage of events in daylight, twilight, moonlight, good weather and bad weather. Demonstrated in New York, it will be ready for the market in about six months.

● **Laboratory Miracles.**—Three new drug discoveries have been made by the Russians. A new method for manufacturing penicillin has been evolved by Professor Yermolayeva. A new drug called phenamin stimulates nervous activity in work involving prolonged nervous tension. A substitute for methyl caffeine reduces the quantity of raw materials needed for the manufacture of the drug by more than 20 per cent.

● **Light and Useful.**—Plastic frames to carry photographs and copy were used by a British electric company in an exhibition which told the public of the company's war-time achieve-

ments. The frames were used as a substitute for plywood, which is in short supply. They were illuminated by three types of fluorescent lighting.

● **The Driver's Right.**—That G.I. amputees can drive a car as well as the next person has been demonstrated in Chicago. Four car makers have adapted the devices. Typical was one incorporating a lever to manipulate clutch, throttle, and brake; a wheel nob for firm grip; an "eye" on the brake handle for a hook hand; a knee light switch; a normal hand gear shift; and a normal turn indicator.

● **Peacetime Nylon.**—At a mannequin parade in London the first British evening dress of nylon was shown. Other examples of rayon fabrics exhibited ranged from full-textured sports cloths to heavy duchess satins and lamés. There were also corded rayons, tie weaves, printed crepes, reversible weaves, and stencilled crepes. Production may be held up for lack of appropriate weaving plant.

● **Therapeutic Medicine.**—British chemists and biologists have discovered a new compound which marks a revolutionary departure in anti-malarial research. The new drug is much more powerful and has a much wider influence upon malaria than any known specific. It is to be distributed in a form known as Paludrine.

● **If Leather's Scarce.**—Shoes made partly of plastic material will be on sale early in the New Year. Experiments in the use of plastic cloths for uppers have proved successful, and bulk production has begun. Carbide of calcium is the base of the new plastic compound.

● **Pick-up Trouble.**—Employees in an American undertaking who were finding difficulty in picking up small metal parts because of the speed the assembly line travelled had their problem solved by one of their engineers, who covered the surface with a thin layer of sponge rubber. This enabled them to get their fingers round the little pieces.

● **100 m.p.h.—Guaranteed.**—A contract for a 100 m.p.h. Diesel-electric train has been placed by a European purchaser with a British locomotive equipment firm which is co-ordinating the resources of a number of British engineering companies to obtain world markets in the Diesel-electric field. The train will have accommodation for 500 passengers. It will be capable of distances up to 800 miles, and is guaranteed to do 100 m.p.h.

"Science can put British Industry on Top"

Hoover's Make a Clean Sweep



and Reconvert

I TALKED with Mr. Puckey for about two hours and then I was taken on a tour of Hoover's Headquarters' factory at Perivale. It was only on that tour that the immensity of this Company's switchover task was forcibly brought home to me. And yet what I saw was but a

fraction of this organisation's achievements, and I remembered those other 16 factories under this same administration whose cohesive efforts had attained and sustained an exemplary wartime production and some of which now were being used in the task of making the Headquarters' reversion a speedily accomplished fact.

Here was a masterly piece of switchover reorganisation. For a whole complex industrial machine had been thrown smoothly into reverse gear without stripping the wheels of the administrative gear-box. If there was a lesson here for industry, it should be propounded. How had the internationally-known Hoover organisation tackled their transition so efficiently? Briefly, the answer is that there has been a cycle of managerial and administrative foresight and capability.

When Hoover's converted to wartime production, the conversion was accomplished efficiently by reason of managerial ability and the plan for

JOHN GILBERT

Interviews

W. PUCKEY

*Director and
General Works Manager
Hoover Ltd.*

reconversion has succeeded for the same reason. War-time conversion had been successfully underpinned by peace time efficiency; war-time efficiency was underpinned by the application of lessons of profitable experience, and reconversion was doubly underpinned by both of these.

It would be as well to remember that hardly a British aeroplane or tank did not rely on at least one item of Hoover equipment—motors, rotary transformers, generators, blowers, propellers and thousands of pieces of ancillary equipment. Some idea of the mass of war equipment made by this firm and its employees can be judged from the number of rotary electric machines made by the end of July 1944. There were over a million rotary electrical machines, including motors, generators, and blowers. And these were but the rotary products of the organisation.

There was also a gigantic mass of static units, including over 23 million of one fuse alone, many thousands of hydraulic variable-pitch propellers, and thousands of complete bomber wiring sets. To keep pace with the Government contracts, the Company expanded and were responsible for the management of 17 factories. The firms taken over covered an interesting section of industry including furniture factor-

ies, a paper mill, a shampoo powder factory, a perfumery factory, a confectionery factory, retail shops, garages and a dance hall.

This in brief gives an idea of the size of the undertaking which swung into wartime production. These factories employed about 11,000 people and a great deal of administrative pioneer work done within this organisation was adapted—after proven example—as national standard practice. Factory risks from enemy attacks were reduced by scattered location of the factories. But a technique was devised in order that this decentralisation should not upset administration. This was achieved by a sound administrative policy which departmentally had proved its efficiency at prewar Perivale.

Teamwork—the Stuff of Success

As far as possible, the firm undertook contracts which as nearly resembled their peacetime products as the circumstances permitted. Specialists in precision electrical engineering, acceptance of production of wartime equipment of a similar nature permitted a national amoeba-like expansion. It was only when the fully-developed productive cell had reached administrative and output maturity that it split. This permitted continuity of a programme of efficiency and it enabled the Company to maintain its peacetime quantity production output at a price attractive to the Government and at the same time giving a fair return for its labours.

It was obvious to me that Mr. Puckey's approach to the conversion from peace to war was based on a fundamental conception of the pre-eminence of management and men in the production set-up. Managerial teamwork, administrative, executive and technical, has been the very stuff of their success, and that is still true of the reconversion programme. Great attention is paid to the selection of executives,

not solely as individuals but as a team—and as a team which grows up with the new job it will have to do.

Only exceptionally do Hoover bring in an executive after the production programme has been planned. This way, the parent executive and administrative team know the executive productive team and the latter in their turn have confidence in their ability, in their knowledge of the job and in their top management.

The inauguration and the expansion of each new factory followed a deliberate pattern and was staffed up with people who could deal efficiently with the class of work for which the factory was opened. It can easily be appreciated how this helped a smooth expansion but very early on it was realised that the selection of men who could knit up with headquarters' ideas was the key to co-ordinated production.

To a great extent, the Hoover organisation was responsible for the idea of bringing the work to the workers and indeed their original outworking factory opened at Gerrard's Cross set the seal of success on this policy. But location of factories was closely attended with an eye to executive efficiency and as far as it was possible the wear and tear on top management and executives was reduced to a minimum by planned factory location. One of the expansion factories at High Wycombe makes the point. Some of the Perivale key-men lived in the vicinity of High Wycombe and in due course they took over the development of this factory. Adjacent plants in the High Wycombe area finally came under the centralised management of the already decentralised High Wycombe factory.

That the firm was able to develop these techniques was possible only because of their prewar management policy. Prewar technique, to which great attention was paid under wartime conditions, included the use of production targets and this is being practised faithfully to-day

Factory floors were clearing for action as draughtsmen prepared the new designs



to enable the Company to achieve its first half-year of reconversion production.

A certain target for every component is fixed. There is nothing new in this, but it was the method in reaching the target that got the results. Instead of aiming at, say, a potential 10,000 unit output in a four-week period, Hoover aimed and still aims at a quarter of that target and sees to it that it is definitely hit at the end of each working week.

During the war, the Ministries regarded their production target technique as a model. There is always a tendency, and every planning engineer is aware of it, that a state of mind can condition the results. A shop may fail to make the mark by a narrow margin in the first week of a month. There is an all-round hope that by the second week it will make good. At the end of the second week it frequently happens that the deficit remains—indeed, it may have grown. And it is seldom that concentration in the last week or last fortnight of any four-week period can produce either good work or satisfactory output.

The Target is Sharp-focussed

Hoover's method now and during the war allows for getting that little bit extra out of a department aiming at its targets, even occasionally by putting something extra into it from another department where the one particularly concerned looks like missing its target owing to circumstances entirely outside its own control.

The production target even now in the carrying out of the switchover plan is a sacred thing and the management is prepared to go to extremes to meet it. If proof were needed of the soundness of the short-term target policy, it lies in the fact that during the whole of last year the firm achieved 98 per cent of its target on all of its work. Every responsible execu-

tive and supervisor knows exactly what his department has got to produce every week for at least 13 weeks ahead. Top management can even schedule six months' production, but it is the departmental supervisor's and the executive's job to see that the weekly maximum is achieved in order that the quarterly or the half-yearly programme comes up to expectations.

Survey for Peace Production

In mapping out the reconversion programme, the Company realises the terrific demand there is for their product, and in tackling reconversion, the firm acknowledges the co-operation they received from Government Departments long before V.E. Day, thus permitting them to lay the foundations for transition. Generally speaking, the Perivale headquarters' factory will be the spearhead in the peacetime production drive and the Government hang-over contracts are now being handled by the outside factories. This has permitted Perivale literally to clear the decks for peace.

A new factory has been built in Scotland where the Company has had several years' experience in war production. This new factory, built by the Ministry of Works under the Board of Trade scheme for special area development, will concentrate on producing fractional horsepower motors and similar rotary equipment.

Not content with returning to the 1939 factory layout, the opportunity has been taken of making a complete survey of the whole factory, keeping in the forefront the consideration of their maximum peacetime production. *Force majeure*, this means that a start on peacetime consumer products can be made, but in a small way. But the plans have been laid for long-term mass production and bearing in mind that at least fifty-six major departmental moves are being made, the task of reconstruction for the transi-

There is still a wartime look about the plug and socket department on left, but a more prosperous, bright and finished air permeates the scene in the motor assembly department



tion and peacetime programme can readily be gauged.

All this is not merely a question of clearing floor space, getting rid of machines and replacing them with peacetime equipment. The machines will neither move themselves nor will they operate themselves without men and they most certainly will not operate efficiently unless manned by the right people. An organisational chart, therefore, has been drawn up outlining the work of the administrators and the executives in advance so that all the moves that have been made, which are now taking place and which will be made, are done in conjunction with the men who will carry out the plan set forth in the reconversion programme. Appointment in advance does a great deal to help every executive planning his own new set-up.

Importance of Office Layout

Having then created the chart and put the right man in the right place, the firm next turned its attention to the physical layout. As far as is physically possible, the new set-up attempts to apply the most profitable lessons of prewar and wartime experience. One feature in the reorganised layout, frequently overlooked in many reconversion plans, has been the re-planning not only of the administrative office layout, but of those offices purely executive and ancillary to actual production. Typical examples of the application of this is seen in the planned location of the Inspection offices, adjacent to the production to be inspected and the Personnel and Labour offices, linked geographically as well as in the administrative sense, with the whole organisational set-up.

Decisions have also been taken on the highest levels dealing with the product itself and these are closely associated with the postwar sales

programme. Many changes which would have benefitted Hoover's permanent production are inherent in the decision to limit the range of products on such a basis as to provide the maximum efficiency of the famous Hoover Cleaners.

Simplification and Costs

This policy, which incorporates a reduction in the multiplicity of models, is closely related to the question of costs and to the most vital decision of all, namely the price of the Hoover Cleaner to the man-in-the-street. Management accepts the fact that their overheads are much higher than in 1939, but the aim is to step-up production per man hour in order to attain a higher productive output with a correspondingly lower overhead cost per unit of production. Thus, the firm are able to offer the public their much-needed Cleaners at exactly the same price as before the war, maintain those amenities of employment necessary to an efficient Company, and at the same time go far towards satisfying the great demand for their products.

We might sum up the highlights of this switchover briefly. There are several factors which have contributed to its success and policies which could be adopted in any factory, large or small.

To begin with, there is an overpowering argument for the use of the short-term target and knitted into this technique is the managerial spirit of teamwork. The whole fabric of productivity it seems, depended during the war and it will also depend after transition, on knowledge: knowledge of three things, the product to be manufactured, the number of products needed during any given period, and the knowledge of management concerning the best men to carry out the programme.

Pictures taken in the same department before and after the switchover plan swung into action. On the right the gloss returns to Hoover finish, as wartime utility beats a hasty retreat





Executives' BRAINS TRUST

THE Question Master and the Brains Trust join in wishing their readers a successful and prosperous 1946. At this the New Year session they answer the following six questions.

1. Are technical salesmen the best?
2. What is "dynamic management"?
3. How can we place departmental maintenance costs?
4. Will this machine help us to sell our goods abroad?
5. What jobs are best done by women clerks?
6. How to restore an unwise wage cut.

A Vital Decision

1 We are facing a delicate problem in appointing a new sales manager. We believe we can fill the position from within the organisation. Our main headache is whether we ought to give the post to a clever salesman of charming personality, or appoint a technical salesman, with the common failing of a rather superior attitude to the customer. (Ours is definitely a technical product which requires demonstration.) Who would be your man?

MR. MARTIN: Not the technical man, in view of his characteristics.

MR. LEVER: I object to the choice being limited to these two people. In any case to regard a customer as a mutt is entirely the wrong way to set about selling or sales. Your attitude should be to show how your product can help the customer do something, or achieve more success in whatever line he is working on.

MR. DAVIS: The choice of a sales manager is very largely conditioned by the type of individual he is likely to interview. They have got to study more closely the market in which they are selling.

MR. MARTIN: We are talking of a sales manager. Your sales manager is essentially an inside man who organises your sales. He must be of such a type as can receive customers. If it is a technical product they are selling, they will appoint technical representatives. There is a very distinct class of people whom we call salesmen who have the *flair* for salesmanship. They are born, not made.

MR. FORD: The organiser who appreciates the technical angle without necessarily knowing the technicalities themselves is of more value than the pure technician, or the man with a charming personality.

MR. LEVER: Yes, but what should we expect from a sales manager? I suggest (1) ability to analyse ways and means of getting results, (2) ability to understand the consumers of his products, (3) a merchandising outlook, (4) organising ability and (5) ability to enthuse others. I think these are really the minimum require-

ments. Have either of these men got them all? If not, I would always be prepared to go outside the organisation to get such a man.

MR. GILBERT: If you are in a jam it is the man who says "I am sorry, I don't know anything about this but will bring our technical man along," who will be most satisfactory.

Q.M. CHISHOLM: The Brains Trust would choose the salesman, not the technician; Mr. Lever would bring in an outsider.

It Sounds Powerful

2 We have been impressed by delivery from one of our suppliers in spite of the extreme difficulties encountered under present day conditions. The only reply we get to our enquiries as to how such efficiency is maintained, is the somewhat cryptic remark that we are using a new technique called "dynamic management". Can the Brains Trust give us any information about this?

MR. LEVER: I am sure that is not the whole story. While good management is of course essential, it is not going to produce prompt deliveries in these days to every customer on the books in such a marked way.

MR. FORD: Nor is it going to produce raw materials.

MR. GODDARD: I imagine these people are following the writings of Mary Parker Follett. She treats the relationship between management and employers in an entirely new way. Her slogan is "make followers out of hirelings." It is not a technique, but an attitude of mind. It works very well in the present Ministry of Labour "Training Within Industry" scheme.

Q.M. CHISHOLM: You feel it is right in this situation?

MR. GODDARD: It is only correct in this sense—it brings home to supervisors that they have another job besides producing stuff. They have got to look at their labour relations just as much as they have to produce goods.

MR. GILBERT: The title of the book is "Dynamic Administration" by H. C. Metcalf and L. Urwick, being the collected papers of Mary Parker Follett; published by Management Publications Trust Ltd.

MR. LEVER: I feel this is not answering the question. I still cannot believe that adopting Mary Parker Follett's outlook, which is that of a political scientist rather than of an industrial administrator, is going to produce your deliveries this week instead of three months hence. What I think they really mean is that their suppliers are a "live" concern, and that they mean nothing more than this in calling it "dynamic management."

Q.M. CHISHOLM: Does it involve a real effort to get a greater degree of delegation?

MR. GILBERT: No. It means getting people to look upon themselves as part of a team.

MR. DAVIS: What Mary Parker Follett aims at is getting a driving force from within.

MR. GODDARD: I have heard from all over the country of wonderful results from this T.W.I.

technique. It does bring home to supervisors their responsibilities. We have been running classes in our factories on these lines for the past six months. Fellows come in quite prepared to scoff, but go away convinced that it is a good idea. We give them fundamentals—show them how to do a job by breaking it down into its component parts. It is a technique of tuition, but as such is only one part of the story.

Job relations is a totally different thing. If a supervisor has any particular problem he applies these principles: (1) Get the full facts. (2) Weigh and decide—consider what Company policy is. (3) Take action. (4) Check result by follow-up.

Q.M. CHISHOLM: When you talk to the supervisors, do they get any idea of the structure of the company?

MR. GODDARD: It is expected that supervisors will have a knowledge of their job and a full knowledge of their responsibilities. But skill in instructing workers, skill in improving methods, and skill in handling workers are the three things which are inculcated into the supervisors by this T.W.I. method. It goes right through to top management.

MR. MARTIN: We are applying T.W.I.

MR. GODDARD: Many firms are—of the bigger firms, about 50 per cent.

MR. FORD: The Ministry of Labour can give full information about T.W.I.

MR. MARTIN: Employees even in the lower categories will be much more interchangeable. That is one thing that is coming out of T.W.I.

Allocating Maintenance Costs

3 We have direct labour costs in connection with our normal manufactured product.

(a) This bears little relation to the direct labour costs incurred by our maintenance employees (tradesmen and labourers). The wages of the latter have no relation to the basic wages of the productive employees. (b) Certain jobs are carried out by the tradesmen and labourers in addition to maintenance. A service charge is made to outside sources for such work.

What methods should be used so as to obtain a percentage which could be applied to the direct labour costs and the tradesmen's and labourers' wages to recoup a fair figure in overheads in relation to the circumstances outlined in (b) having in mind the circumstances outlined in (a)?

MR. DAVIS: They have first of all to make up their minds as to what is to be termed direct costs and what indirect costs, but even then they will still have variable direct labour costs per hour, according to the class of labour employed with the resulting variable overhead if applied on a percentage basis. I presume that the real point they are making is that the labour cost of direct work can vary very accurately because of the divergence in rates of the direct and indirect type of labour employed, which result in a fallacious evaluation of overheads when applied on a percentage basis. Surely this can

Who's Who on the Brains Trust

F. L. GILBERT

Managing Director,
Production Facilities (Films) Ltd. Accountancy Service

J. M. DAVIS

Director, B.D.

be overcome by determining a straight rate per hour for overhead, irrespective of the class of labour.

Q.M. CHISHOLM: The questioner wishes to apportion the costs, that is to say, the proportion of wages earned by the maintenance staff to the departments concerned in the manufacture of his product.

If he has not already coded his productive departments he should do so at once, beginning with the general office and finishing with the despatch stores. Every section of his factory should be given an initial letter and subdivisions an initial letter and numeral.

Two operations are then necessary in order to discover the proportion of maintenance costs per man per week borne by every department. First every maintenance worker should be provided with a weekly job card ruled to provide columns for (a) worker's description of the job in hand, (b) the hour at which he started and the hour at which he finished, (c) a column left blank for the cost clerk, (d) a column left blank for the extension of wages multiplied by hours on one job. The card is ruled with, say, 20 parallels giving space for defining and extending 20 maintenance jobs. When this card is finished within one working week the maintenance foreman issues the worker with a second card in which case in that week the maintenance man may have either two or more job cards.

At the end of the week the cards are collected and handed to the cost clerk. He knows the departmental codes and by assessing the workman's information he can assign the right code to column (c).

At the top of the card beside the workman's clock number he enters from the pay sheet the workman's rate per hour. He does this with all the maintenance workers' cards. He then settles down to multiply the time given by the workman by the rate he himself has discovered from the wages sheet and enters this in column (d). He then turns over the card to its blank side and summarises the information from the parallel columns.

For example, the workman may have found himself in Department A1 on Monday for 2 hours. Again on Wednesday and Thursday for 1½ hours each time. Beginning, therefore, on the reverse of the card the clerk enters "A1 5 hours at 2/- an hour. Total 10/-." Thus revealing that 10/- of this maintenance man's wages go as a charge against Department A1.

This is the analysis of the job card and the analysis is built up on an analysis sheet headed "Maintenance", with columns for each coded department. Taking the total of A1 then from every job card and entering this under column A1 in the analysis, he obtains the total in cash of all maintenance men in Department A1. This operation is repeated by the cost clerk transversely across the whole analysis sheet. The addition of each departmental coded column horizontalwise should then give the same figure as the maintenance department's wages sheet bill and at the same time furnish top management with a detailed figure of the cost to every department of the maintenance wages sheet.

Will it Help Sales?

4 We are informed that there is an apparatus which simultaneously demonstrates and instructs. Each separate part can be illuminated as desired, and a recorded commentary is synchronised to explain the visual images as and when they appear. We believe we could use this equipment as an aid to selling our product—an intricate machine. Does the Brains Trust know anything about this apparatus, and could it be carried in a salesman's car?

MR. GODDARD: This is our old friend, the talking-pictorial demonstrator.

MR. MARTIN: The Ministry of Aircraft Production used several of them. They can be carried in a small traveller's van.

Q.M. CHISHOLM: Are there any limits in its use?



Close-up from both sides of the tables.
MESSRS. GILBERT,
GODDARD, DAVIS
AND LEVER

J. P. FORD

General Manager, Personnel & Welfare Officer,
B.E.S.T. & E. Co. Ltd.

H. A. GODDARD

Morris Motors Ltd.

E. A. LEVER

Divisional Manager,
The Pressed Steel Co. Ltd.

JOHN MARTIN

Secretary, Paints
Division I.C.I. Ltd.

MR. FORD: Almost none. There is an illuminated panel on which you display a drawing of the parts of your instrument which you want to put across. You can illuminate each of these parts separately so that the others are left blank, and there is a talkie commentary. For machines or gadgets which are rather intricate, there is also a sort of showcase which can be lit up to give a three-dimensional effect.

MR. MARTIN: I have seen one where they just use a gramophone. As long as you have electricity and a gramophone, your instructor presses a button as the record goes round. It can be carried in a car.

MR. FORD: It can be run from a car battery. Also the commentary can be geared so that the harmonics on the record can be picked up and used to actuate the lighting system so that you can automatically spotlight the part of the picture to which the sound track refers.

The Department of Overseas Trade are setting up demonstration centres in foreign countries. There is one in Cairo where there are a dozen different booths. In each booth one manufacturer's product is displayed. You can plug in earphones and listen to the sound track in your own particular language describing the products displayed.

Where Women Excel

5 For the first time in our history we have employed women in our costing department. We find that these women do a better job than the men clerks previously engaged. The work is detailed and finicky. We have decided to retain these women and find the ex-cost clerks other work on their return from the Forces.

What other jobs can be more suitably carried out by female clerks? Check list please.

MR. GILBERT: Women on the whole do repetitive and somewhat monotonous jobs rather better than men. This applies more particularly to factory work, but is equally applicable to

office work. Except for filing and registry work the scope in the office is rather restricted.

MR. DAVIS: Obviously it applies generally to office and factory work. The particular jobs on which it has been found that female labour is unusually good are jobs not necessarily of a repetitious nature but where a *retentive memory is required rather than reason*. Some of my best men in costing have had to be taken out of certain jobs simply because they think for themselves. Discretionary powers can be abused. It is my experience that female labour will deal more competently with jobs falling in the *cost collection category*, but rarely take a sufficiently wide view when dealing with *cost interpretation*.

Q.M. CHISHOLM: There is something in the American technique of letting office work fall into three family groups; the clerical, stenographic and accounting groups. Where accounting has been mechanised, sorting, tabulation, etc., was regarded as thoroughly broken down and given to females.

With staff shortages to-day, analysis has shown that the following jobs can be quite satisfactorily carried out by female clerical labour. General junior clerk, assistant clerk, clerk, senior clerk; in the stenographer family, junior typist, typist, senior typist, junior secretary and secretary; in the accountancy department, time clerk, pay clerk, cost break-downs clerk, tabulator operators, calculating machine operators and assistant cashier.

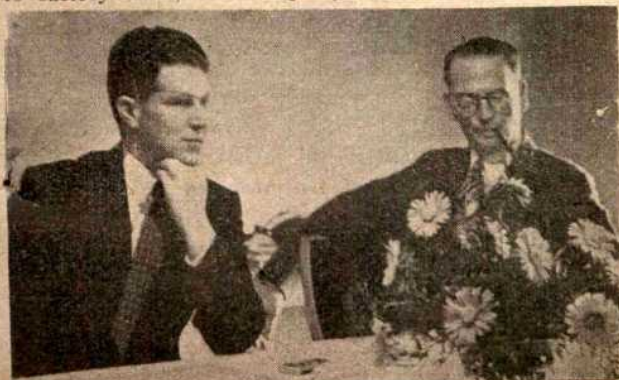
Restoring Staff Salaries

6 During the war production activity forced us to step up office working hours to something like equality with the production floor. To recompense office workers, we gave a graduated bonus on their basic salary. Some months ago we returned to normal office hours—9 until 5.30—and cancelled the bonus payment. Results, dissatisfaction and loss of personnel. We are prepared to restore the salary cut but without losing too much managerial

face. Have the Brains Trust a formula for tackling such a job?

MR. GODDARD: We had the same set-up in one of our subsidiary companies. The Board decided the only thing to do was to retain the bonus and they consolidated it into the basic salary. All our questioner can do is to set new rates.

Q.M. CHISHOLM: If I may say so I think this question betrays grave managerial inability. Obviously to upset good staff relations by effecting economies which scarcely show was a bad decision. I don't see how much face can be saved. Restore the cuts forthwith.



Business Calling . . .

Quotes the Policy of Leaders Helping to Shape Peace Plans

Sir MONTAGUE BURTON *Let's Work in Harmony*



"GIVEN satisfactory relations and understanding in industry as a whole, and a determination to excel, the signs are that the country will enter upon a new era of prosperity," states Sir Montague Burton, LL.D., J.P., chairman and managing director of Montague Burton Ltd.

"Success in reconstruction and rehabilitation will be determined by management and men working un-

reservedly together. Employees are entitled to, and generally speaking do receive, the maxima that industry can afford, instead of the Board of Trade minima.

"That fact should smooth and pave the way towards closer co-operation; with industrial strife a mere memory of the past. No system of control, however skilfully devised, no methods of efficiency, can achieve and maintain the economic and social well being of the country without whole-hearted co-operation. In unity is strength."

Sir JOHN HAY *Unfair Discrimination*



REFERENCE to what he considers to be discrimination against Malaya in the price-fixing of rubber is made by Sir John Hay, chairman of the Kamuning (Perak) Rubber & Tin Company Ltd. Sir John, who is not inferring anything as to the economic price of rubber, points out that during the war the need for rubber was so imperative that it was necessary to make special

arrangements with each of the remaining rubber-producing territories under which a price was fixed at a level high enough to stimulate maximum production.

"A price has been fixed for rubber coming from Malaya," he continues. "Unlike the arrangements with other territories, it was not settled with or after consultation with, the

rubber industry. It was determined by powers arbitrarily exercised over a territory stricken by the catastrophe of war. One would have imagined that under circumstances where discrimination was to be made, it would be exercised in favour of a territory which had suffered so grievously from the war."

J. A. G. BISHOP *An Appointment*

THE directors of Lamson Investments Ltd. have elected Mr. J. A. G. Bishop, managing director of the Lamson Paragon Supply Company Ltd. and Mr. R. L. Herring, joint managing director of the Lamson Engineering Company, to the board of the company. Mr. V. Heroys and Mr. B. H. Pearce are elected joint managing directors of Lamson Investments Ltd.

Sir ALAN GORDON-SMITH *A New Chairmanship*



THE name of Sir Allan Gordon-Smith, K.B.E., D.L., has been so long and so closely allied with the "Smith" group of companies. Now, he has been appointed the chairman of S. Smith & Sons (England) Ltd. and its associated concerns.

Sir Allan, whose grandfather and father founded and built up the business of S. Smith & Sons, became managing director in 1913,

when the firm became a limited company under the name of S. Smith & Sons (M.A.) Ltd., now grouped into four main divisional companies: Smiths Motor Accessories Ltd., Smiths English Clocks Ltd., Smiths Aircraft Instruments Ltd., and Smiths Industrial Instruments Ltd. Each controls a number of associated companies.

Mr. GEORGE W. LUCAS *Distribution Unbalanced*

THAT one million workers are to turn over from distribution to production next year is revealed by Mr. George W. Lucas, President of the Motor Agents' Association. "Before the war," says Mr. Lucas, "there were nearly three millions engaged in the distributive trades. Authoritative estimates place two millions as the maximum allocation to distributive trades

next year, and even in four years' time when some degree of normality is present, three quarters of a million less than 1939 should be the optimum figure.

"By any sensible equation of the varying demands for man-power, it is clear that there will have to be a substantial reduction in the numbers engaged in the distributive trades if enough man-power is to be made available for productive industries. Unless some form of control of entry in the distributive trades is brought about, redundancy will result in increases in commodity prices which will be economically justified."

Mr. ASHLEY S. WARD

Strike Out for Freedom



A WARNING against being led into the too easy path of State regimentation comes from Mr. Ashley S. Ward, chairman and managing director of Thomas W. Ward Ltd. He declares: "With man-power available, freer interchange of food and goods and the relaxations of controls, some of us are still hoping that this freedom which we have been fighting for will once more be our proud

possession, and the envy of every other country in the world, but there seems to be a very great danger of our being led into the easy path of complete State regimentation, instead of the more difficult one of high enterprise, which notwithstanding what anybody may state has placed the British Commonwealth of Nations in the position in which they are to-day."

PREMIERS AND PRESIDENT

Ally for Reconstruction

"WE have considered the question of the disclosure of detailed information concerning the practical industrial application of atomic energy. The military exploitation of atomic energy depends in large part upon the same methods and processes as would be required for industrial uses. We are not convinced that the spreading of the specialised information regarding the practical application of atomic energy, before it is possible to devise effective reciprocal and enforceable safeguards acceptable to all nations, would contribute to a constructive solution of the problem of the atomic bomb. On the contrary we think it might have the opposite effect. We are, however, prepared to share, on a reciprocal basis with others of the United Nations, detailed information concerning the practical industrial application of atomic energy just as soon as effective enforceable safeguards against its use for destructive purposes can be devised."—From the joint statement issued in Washington by Mr. Attlee, President Truman and Mr. Mackenzie King, after their discussions on atomic energy.

Mr. H. DRAYTON

P.A.Y.E. Staff Costs



PROTEST against industry having to shoulder the burden of tax collection is made by Mr. H. C. Drayton, chairman of the Anglo-Scottish Amalgamated Corporation Ltd., who recalls that on a previous occasion he mentioned the cost imposed upon industrial organisations by the collection of income tax from employees.

"Those of us who have had experience of the working of this part of the income-tax law have found it complicated and necessary to employ additional experienced staff," he continues. "It does not seem fair that industry should be burdened with this additional overhead, which is in fact doing the work of the State."

"It would appear only fair and reasonable that this cost should be spread over the whole of the community, and in certain foreign countries with which I am connected, where the same position appertains, the employer has been allowed to deduct a percentage from the collection to cover his out-of-pockets. In my view it is only reasonable and just that the same procedure should be followed in this country."

Sir WALTER BIRCHALL

Post Office Appointment

IT is announced from 10 Downing Street that Sir Walter Raymond Birchall is to be Director-General of the Post Office in succession to Sir Thomas Gardiner, who is retiring. Sir Walter was one of the leading figures behind the developments of the telephone service and the conversion to the automatic system.

Mr. ARTHUR H. SCROGGS

Plywood for Furniture



THERE is little doubt that plywood will be even more extensively used for furniture in the future than hitherto, according to Mr. Arthur H. Scroggs, director of the National Plywood Corporation. While the world's timber stocks remain in their present depleted state, says Mr. Scroggs, it is inevitable that much of the plywood offered to manufacturers should be made from

Colonial timbers with unfamiliar names, but which are none the less reliable.

Statistical Quality How to Use It — and

By D. S. McNAUGHTON
Hercules Cycle & Motor Co. Ltd.

Appearances to the mind are of four kinds. Things either are what they appear to be; or they neither are, nor appear to be; or they are, and do not appear to be; or they are not, and yet appear to be. Rightly to aim in all these cases is the wise man's task.

—Epictetus. "Discourses"

SOME twenty years ago, the use of statistical methods was confined almost exclusively to biometrics and the social sciences. To-day their use in the professions and industry has been developed to a degree which the progressive executive cannot afford to ignore.

Before one can discuss profitably, the application of statistical methods in industry, one must first of all make some attempt to dispel the apparent confusion as to what one means by "statistics".

The Oxford Dictionary gives two definitions, one in the singular and the other in the plural. In the plural statistics mean numerical facts systematically collected; the singular use of the word statistics refers to the science of compiling, presenting, analysing and interpreting those numerical facts. It will be seen therefore, that the term is equally applicable to the raw material in the form of accumulated data and to the science of using this raw material in order to obtain accurate information.

The True Interpretation

This constant striving after accurate relevant information is one calculated to tax the energy and ingenuity of business executives everywhere, and any tool which will facilitate the pursuit or increase the accuracy and precision of such information is always worthy of his closest scrutiny. The managing director in attempting to achieve the maximum cohesion in the trinity he controls, namely finances, distribution and manufacture, is no stranger to numerical data, but neither is he a stranger to the possible misinterpretation of such data.

It should be emphasised here that while the writer of this article deprecates strongly that zeal of many statistical propagandists which

tends to suggest that statistics is the cure-all for all industrial and administrative ills, he does aver that knowledge gained from the statistical approach to many problems often means the difference between enlightened and unenlightened planning.

It would surely be true to say that we in this country have tackled the application of statistics in industry in a much more practical way than our American cousins and in a way better calculated to yield greater economic advantages. In marketing and distribution however, we lag sadly behind and we have still to realise the wealth of valuable information which is the reward of the statistical analysis of sales returns or of a well planned statistical survey of potential or existing markets.

Three Broad Classes

For the purpose of this discussion, industry could be classified into three broad categories, namely:—

(a) Receipt of raw materials and plant required for the manufacture of the particular commodities under review.

(b) Processing, fabrication and inter-departmental routine (that is where the finished product of one department is the raw material of the next).

(c) Dispatch of the manufactured product as one conforming in every detail to the design specification.

The statistical technique best applicable to the inspection of incoming raw materials is that produced by the indefatigable energies of Messrs. Dodge and Romig of the Bell Telephone System Laboratories in America. They have perfected various systems for sampling, the best known of which have now been widely published by their "Tables for Single and Double Sampling".

It is obviously uneconomical for a manufacturer to inspect every single piece of raw material received into his factory, but at the same time he requires some indication of the quality of such raw material. He has perforce therefore to attempt, by means of inspecting a comparatively small sample, to form an opinion of the overall quality of the bulk and by so doing he has stumbled across that vexatious question which is the origin of the "Theory of Sampling".

This method of statistical induction is based on two laws, namely "The Law of Statistical

Control Make it Keep Costs Down

Regularity" which states the characteristics of the bulk; and "The Law of Inertia of Large Numbers" which states that the characteristics of large groups of data are more stable than small ones.

The manufacturer runs two risks. He might in attempting to keep down costs, inspect too small a sample and thereby run the risk of accepting a bulk of poor quality material or he might, in his anxiety to avoid poor quality material, incur an unnecessarily high inspection cost.

The Dodge-Romig tables provide the most economic size of sample which must be inspected to ensure the required level of quality. If a manufacturer is prepared to tolerate a small percentage of defective incoming goods, he will find a table to suit his requirements as the tables provide for all contingencies from 0.1% to 10% defective.

An Inch Not a Mile

Obviously it is very often an economic measure to save inspection costs by being prepared to tolerate a small proportion of defectives which could be extracted by the assembler on the assembly lines. But if a manufacturer is prepared to accept 1% defective, he requires some safeguard that he is not accepting 3% defective material. By using the Dodge-Romig tables, he has this assurance. There are many more sampling schemes in existence now, all of which are a modification of the Dodge-Romig, but few of which provide the same high degree of assurance.

Those responsible for accepting delivery of new plant have in statistics a most useful tool. A machine tool manufacturer will guarantee a machine tool to work to a particular tolerance and will usually arrange for tests to be carried out at the purchaser's works to prove that the machine can work to this tolerance.

But experience has shown that it is one thing to *achieve* a certain standard of accuracy, and another to *maintain* that standard, and it is not enough to run merely a few test-pieces off in order that one might estimate the variability. The purchaser must be essentially interested in the capabilities of the machine over a lengthy run under actual production conditions.

The best and a very simple method of tackling this problem is to measure, say, one hundred pieces produced by the machine and to cal-



Sir Edmund Crane, Chief of Hercules is intensely interested. His product, renowned for soundness and strength owes much to S.Q.C.

culate the standard deviation which is the best measure of variability. This measure with accuracy the effects of all influences whether due to assignable causes or to fortuitous circumstances. The standard deviation is defined as "the root mean square deviation" and is a parameter familiar to anyone who has studied even the rudiments of statistical quality control.

Due to the splendid constructive work and the propaganda of Department S.R.17 of the Ministry of Supply, the advantages to be gained from the common-sense application of statistical quality control on all processes within a plant are already well known and require no emphasis here. Whether the conditions in a plant are those of short run production or flow production makes little difference.

Where one has quality control charts running on a process, be they Fraction Defective or Direct Measurement charts, one has a running commentary on the state of one's production which affords obvious advantages to production and inspection personnel alike. There would appear to be in the minds of some, a false concept that a quality control procedure of this nature must inevitably entail endless and laborious clerical work. This attitude is so erroneous that one can only conclude it to be the result of a complete lack of information on the subject or of that type of prejudice which distrusts an industrial innovation on the grounds either that it "won't work" or that "it might be a satisfactory procedure for some plants but not for this one".

Investigation by Statistics

This of course is sheer supposition and most improbable, but the only way to ascertain the truth is to conduct a well planned experiment with the technique and there will indeed be extenuating circumstances if the experimenter does not find that, not only can it be used to advantage, but that there are distinct possibilities of a substantial reduction in inspection costs, an even production costs, in the intelligent application of the technique generally.

A more advanced application of statistical methods lies in their use as an investigational technique. This aspect is perhaps the best justification for statistical methods in industry and it marks the difference between the industrial investigator on the one hand and the laboratory experimenter on the other, a difference which has been stressed by many writers and is briefly this.

The laboratory experimenter is usually in a position to be able to plan his experiments in such a way as to be able to keep all independent variables under his control and by repeating again and again his experiment he arrives at a unique result, the accuracy of which is irrefutable and requires no test of significance.

Value of Variable Analyses

Because it is almost impossible and nearly always uneconomical for the industrial investigator to keep the independent variables under his control, he can only obtain at best a typical result, the non-statistical consideration of which might lead to spurious and costly conclusions. However by using such techniques as correlation, analysis of variances and factorial analysis he can from the minimum possible data achieve a high degree of accuracy.

The cost accountant is most familiar with this difficulty of obtaining a unique value in many aspects of industrial costing. It is well

known that a particular operation, by reason of the fluctuations in output and the ephemeral differences in tool and service charges, would appear to cost considerably more one week than the previous week.

He is consequently forced into various arbitrary methods of determining costs which may turn out to be fairly accurate in the long run of events or which may result in either an over-generous or insufficient forecast. These costing variables might be wholly or partially compensating or wholly additive and there is no doubt that technicians with a knowledge of statistical methods can take up cost investigation where the accountant has perforce to lay it down.

The dispatch of the finished product comes under the same category as incoming goods and again the Dodge-Romig tables are the best media for assessing the overall quality of a bulk from a comparatively small and economic sample. Indeed if that reciprocity could be achieved throughout British Industry whereby the supplier always statistically sampled his out-going product at a level of quality somewhat higher than the minimum the consumer was prepared to accept, there would be considerably fewer rejections and a saving would ensue in the present expenditure on the part of manufacturers who feel it incumbent upon them to spend money upon the rather negative task of inspecting a product that has in all probability already been submitted to inspection prior to delivery. In an industrial country such as ours, this measure



1. Factory tuition in statistical quality control. A class at the Hercules factories being initiated into the formation of the characteristic curve of normal production

2. Another 'shot' of statistical class at Hercules. This illustrates the type of Comparator in general use for the 'direct measurement' system of quality control

3. Statistical quality control viewers at work, showing Comparators in use, in conjunction with a quality control chart



would soon amount to a substantial national saving, the economic advantages of which are too manifest to require comment.

Industrial management is forever in search of truth regarding conditions existing in the plant, and there can be no doubt that as an aid to this acquisition of truth, statistical methods can play a very important part not only in locating trouble but in providing some tangible measure of its magnitude.

It is being proved that this emphasis on the plant itself and the use of statistical methods to give early warning of change will automatically ensure high levels of quality and output and reduce the costs of post-mortem investigations by going a long way towards removing the need for them.

The Trained Man is Best

In conclusion, one word regarding the best type of man to practise statistical methods in industry. He is definitely the technician who already has a profound knowledge of the processes and traditions obtaining in the plant and who has taken the trouble to study statistics and *not* the academic statistician who would have to grope for knowledge of the processes.

The latter evolves the methods which are fundamental, and the former takes these methods, not as a substitute for technical knowledge but as a strong reinforcement thereto, and

applies them to his own particular problems. The following translation from Laplace which, although possibly a little loose, still has the meaning unimpaired, expresses the case perfectly clearly. He says: "Statistical method is fundamentally common sense reduced to calculation. It exhibits with accuracy what practical minds feel by a kind of instinct without being able to account for it to themselves."

The urgency of our war-time programme tended to make us bolder in adopting new and revolutionary ideas. A great many of these ideas will play an important part in the transitional period in which we now find ourselves.

In many respects, something of an industrial revolution has taken place, so much so that many practices considered as modern before the war are now out of date. Also, the transitional period for many means a fresh start almost from rock bottom. What better conditions to discard the old and adopt the new?

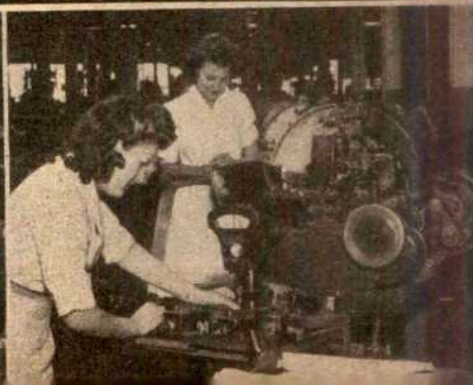
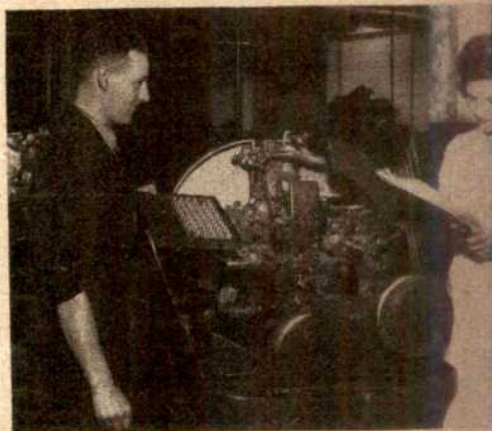
It is the duty of those responsible for bringing to fruition the complete industrial and economic recovery of this country to examine closely *all* modern techniques and not allow prejudiced opinion to regard them as being incompatible with one's production methods.

A few well planned experiments will help the executive to decide just what scope there might be in his organisation for any new technique and almost certainly he will find, whatever his industry, that statistical methods can play a very important part.

4. Statistical quantity control viewers 'controlling' a battery of automatics

5. A clear illustration of the actual 'sample' being taken in accordance with the predetermined Sampling Time. This picture illustrates the method by which one girl takes the actual readings whilst the other makes the calculations

6. Shows an actual machine being controlled, and portrays—the setter, the quality control inspector with her charts, and the component being manufactured



PLAN ACCOUNTS As You Do Production

SAYS R. H. STEWARD, A.I.A.C.,
Commercial and Industrial Consultant

DURING the past few years and particularly the war years my activities have brought me into contact with the financial accounting systems of many firms of all types both large and small. I have been continually surprised by the lack of design and method in all too large a percentage of these cases. It seems that even to-day there are a great number of people in charge of commercial and industrial organizations who regard scientific recording as nothing more than an expensive fad, and fail to realise that properly designed records and accounts help to save money and reduce costs.

In many cases the financial accounts are a sort of "Cinderella" of a firm's records and so long as final accounts of some sort can be produced therefrom no consideration is given to extracting from these accounts (which are essential records) vital information which all businesses must have in order to succeed, especially to-day. In these times few business men would dream of laying down a production plant without first designing a layout so as to secure the most efficient use of machines and space. Why not then, do the same for your financial accounts.

Basically financial accounts record two types of receipts and expenditure, Capital and Revenue, and are usually divided into three main records Private Ledger, Debtors (Sales) Ledger and Creditors (Purchase) Ledger which together with their respective books of original entry (Journals, etc.) make up the "accounts". The two latter ledgers are records of day-to-day details whilst the first one is the heart of the whole system and is usually the most neglected.

In the first place the so-called "Private" ledger should be divided into two main sections:

a. Private Ledger containing really private details e.g. records of the firm's fixed assets capital, financial liabilities and any other items of a purely private nature (directors or partners private accounts), detailed trading and profit and loss accounts.

b. General Ledger, which contains in summarised form all the firm's operating accounts, e.g. purchases, sales, and trading expenses. Where branches are concerned each branch can keep a general ledger and the operations of the firm or group as a whole should be contained in the main or head office General Ledger.

It is important to appreciate that this latter ledger is an extremely flexible record, and can be sub-divided in many ways so as to suit the requirements of a particular business and its methods of operating.

The next step is design, classify, and group the accounts to be used. As far as the Private Ledger is concerned this is usually a simple matter and the following groups will normally suffice.

Capital Accounts; Loan Accounts; Asset Accounts; Personal Accounts; Trading Account; Profit and Loss Account; Appropriation Account.

The General (or Operating) Ledger is rather more complicated and requires considerable thought in order to devise a set of accounts to suit the particular business and to supply the maximum amount of information.

Begin with Classification

I have found in practice that the operating accounts for an average manufacturing concern can be conveniently divided into nine main classes as follows:

1. Material Purchases.
2. Labour.
3. Manufacturing Expenses.
4. Commercial Expenses.
5. Selling and Distribution Expenses.
6. Capital Expenditure.
7. Sales
8. Sundry Receipts.
9. Miscellaneous Accounts.

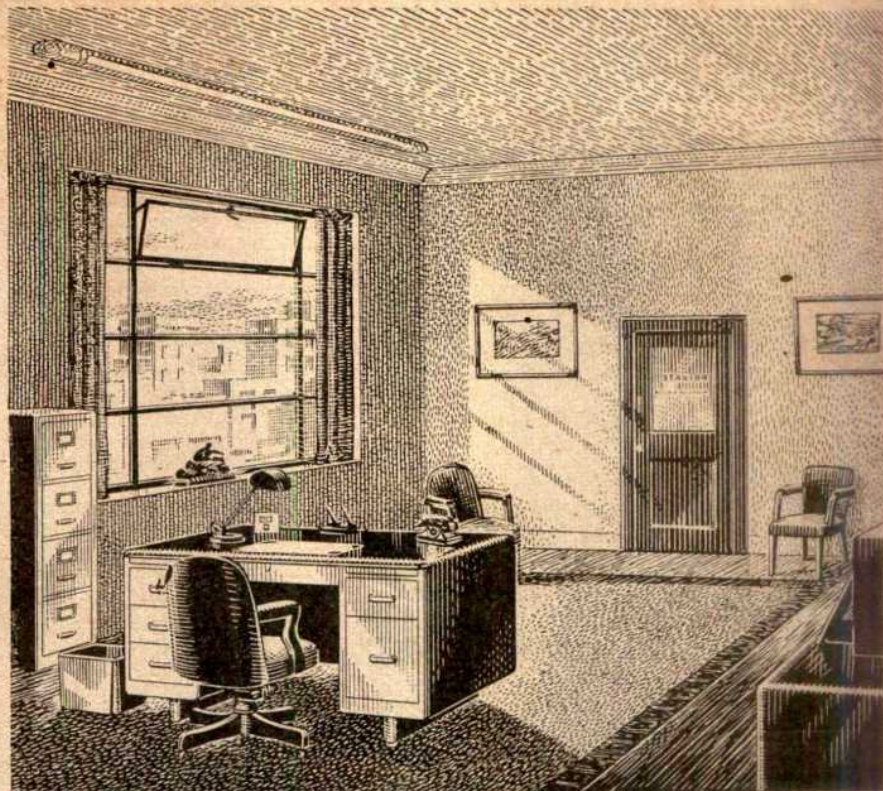
Certain of these classifications are further subdivided into sub-classifications as follows:

1. Purchases. *a.* Materials for Production.
- b.* General Stores.
3. Manufacturing Expenses. *a.* General.
- b.* Repairs and Maintenance.
4. Commercial Expenses. *a.* General. *b.* Financial.
5. Selling and Distribution. *a.* Selling. *b.* Distribution.

These main and sub-classifications are the "framework" on which the detailed design of the accounts is built up. At this stage it is necessary to consider the use of Accounts Classification Numbers. These are code numbers one of which is assigned to each account and used for reference and posting purposes throughout the whole accounting and book-keeping system.

The use of such code numbers is by no means new, but for some reason it has not gained the popularity and general usage in this country as it has in America. Speaking from personal experience however I would find it very difficult to do without them. Such a sys-

First things first . . .



The Managing Director's Office

This could be your office . . .

The layout of your office is important—it reflects the dignity and efficiency of your own organization.

More than fifty years' experience has equipped us well to act in an advisory capacity in the planning of office equipment.

Art Metal Steel Office Furniture lends an air of distinction, dignity and assurance.

May we post our Furniture Brochure No. 60 ?



Art Metal



CONSTRUCTION COMPANY

OFFICES AND FACTORY: 201 Buckingham Palace Road, S.W.1.
Telephone: Sloane 5201 (6 lines).

tem as I have indicated has many advantages including the following:

a. It assists in the identification and allocation of expenditure by removing any doubt caused by vague wording on the part of the employee responsible for making allocations.

b. It provides an element of security and secrecy if and when required.

c. It provides a quick and certain check on the inclusions of accounts in trial balances, etc.

d. It provides easier posting references, and also facilitates speedy checking of postings.

e. It saves labour in writing headings, etc., particularly when analysing and extracting statistical information.

f. It can (and should) be applied to stores records and thus assists in integrating financial and other essential records.

In a scientifically designed accounting system it may be necessary to use one or more additional books of original entry; for instance a Wages and Salaries Journal for analysing and collating all wages and salaries information so that properly allocated totals are posted to the General Ledger. It will be seen that although this may mean a small addition to the number of books usually kept, any additional work will pay for itself by reason of the extra information which will be on hand at all times, instead of having to put staff on overtime possibly to

obtain information which is not usually kept, but is required for a special purpose.

Certain minor but important activities of a commercial organization, are often dealt with in a manner which makes the ascertainment of running costs extremely complex and involved. This state of affairs is easily remedied by means of "Operation Accounts" which are in effect miniature Trading Accounts. Take for instance the Drawing Office—the Drawing Office Operating Account would be debited with all salaries, materials, direct expenses, and (if great accuracy is required) proportions of relative overhead expenditures. If charges are made to customers these are credited to the account, so that the balance at any time is the cost of running the department for the period under review. By the use of such accounts as these small firms can obtain essential information without having to run service costing systems in order to do it.

As indicated above, stores classification numbers should be based on the same code used for the accounts, so that any articles or class of stores has only one reference throughout the whole of the organization, again reducing labour and also reducing the possibility of errors.

It is time that the traditional form of Trading and Profit and Loss account was discarded, at least for internal purposes. I have known

Please turn to page 106

ANALYSIS OF FINANCIAL ACCOUNTS									
FOR:-									
	CURRENT PERIOD		YEAR TO DATE		CORRESPONDING PERIOD LAST YEAR		PREVIOUS YEAR TO DATE		
	AMOUNT	% ON TURNOVER	AMOUNT	% ON TURNOVER	AMOUNT	% ON TURNOVER	AMOUNT	% ON TURNOVER	
A SALES TURNOVER	100		100		100		100		
B MATERIALS CONSUMED									
C PRODUCTION LABOUR	100		100		100		100		
D MANUFACTURING EXP									
PRODUCTION EXPENSES									
GENERAL FACTORY EXP									
REPAIRS & PLANT MAINTENANCE									
DEPRECIATION									
E COMMERCIAL EXPENSES									
OFFICE & DISCOUNTS									
GENERAL OFFICE EXPENSES									
SALARIES & TAXES									
DEPRECIATION OF EQUIPMENT									
F SELLING & DISTRIBUTION EXP									
TRAVELLING & ENTERTAINMENT									
ADVERTISING & SALES EXP									
SALARIES & COMMISSION									
WAREHOUSE RENTALS & EXP									
DEPRECIATION - VEHICLES									
TOTALS - B, C, D & E									
F TRADING PROFIT (A - C + D + E + B)									

FINANCIAL PRODUCTION SUMMARY FOR:-							
	TOTAL	PRODUCT A	PRODUCT B	PRODUCT C	PRODUCT D	PRODUCT E	PRODUCT F
SALES FOR PERIOD							
QUANTITY PRODUCED (IN UNITS OF PRODUCTION)							
VALUE OF PRODUCTION AT SELLING PRICES							
COST OF PRODUCTION							
MATERIALS CONSUMED							
PRODUCTION LABOUR							
MANUFACTURING EXPENSES							
COMMERCIAL & SELLING							
DISTRIBUTION							
TOTAL							
PROFIT (OR LOSS) EARNED IN PERIOD							
ADD PROFIT (OR LOSS) BROUGHT FWD							
TOTAL PROFIT (OR LOSS) EARNED TO DATE							
FINISHED GOODS STOCK AT BEGINNING OF PERIOD							
ADD VALUE OF PRODUCTION							
LESS DELIVERIES IN PERIOD							
STOCK AT END OF PERIOD							
INCREASE OR DECREASE							

Two forms planned for Accounts Office efficiency. The simple Analysis of Financial Accounts form shows various groups of expenditure and cost expressed as percentages of turnover and production labour

The Summary form imposed illustrates another useful statement easily and speedily prepared when your Accounts' Office is properly streamlined



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Five SHORT CUTS to Office Efficiency

Why Untidy Files?

IT is just as easy to-day to keep a neat filing system as it is to put up with an eyesore. Anyway the eyesore is usually inefficient. Files System Manufacturers have designed modern lay-outs on the principle of "lining up", and they are all good. It is merely a question of deciding what you prefer, and then buying the guides and folders to make up the set.

"Lining up" can be carried a step further, and applied to typing the labels. One of the first rules is that the file name should be written first on the folder label. Note what happens when labels are typed informally. The eye, ranging over the filing cabinet, zig-zags along the irregular margin.

Office workers should take a lesson from the telephone book, and do what the Post Office does for helping the public. About 15 per cent is reckoned to be saved by having that straight left-hand margin.

Streamlined Routines

THE office lay-out should be planned so that the flow of work will conform to straight line principles. Unitize certain operations, locating related units or departments at close proximity. Each unit or department should be set up as a self-contained working entity.

A unit might involve one single employee, but the office manager should see to it that it is complete, with every necessary appurtenance. Members of a working unit ought never to find it necessary to go beyond the boundary of their unit in order to attend fully to the details of all assigned work.

Office Reconversion

HOW many changes in the office lay-out were made to accommodate some war time activity? Office managers should review these changes in the light of switch-over requirements.

How many routines were installed to safeguard war-time schedules? Are they still needed? How many reports were needed in order to comply with one or other Ministry's requirements? Have these been dismantled, or revised to fit current conditions?

There is also the other side of the picture—positive action. Are the mailing lists of 1939 of any real use to-day? Are customer records up-to-date? If you have suffered from zoning, is the office prepared to do zone?

These questions typify the switch-over re-organisation in a large manufacturing office. When they had been answered the office manager demanded a re-allocation of space, more space from one department and less from others. Changes in routine flow demanded changes in office lay-out.

This executive drew up a floor plan, outlining in red all space occupied in connection with jobs becoming obsolete. The plan spotlighted the probable changes.

Phone Service

WE have talked about telephones in this column many a time before to-day. Your switch-board operator is one of your ambassadors. She can make or mar an impression.

But there is more to it than that. The right kind of telephone service develops business, but the wrong kind does not only repel business but feeds it to more progressive and more reputation-conscious firms.

All too often, and especially during the war years, the switch-board girls have lived in splendid isolation, been subject to the minimum of supervision, and have played no small part where they were discourteous and inefficient, to upsetting inter-departmental harmony and impeding executive efficiency.

Office managers might do well to emulate the example we came across the other day, where the office manager instituted a number of test calls from outside and inside his organisation to check upon the firm's switch-board service.

Two Desk Checks

TOP office management might profitably make the following desk checks, one during working hours and the second after the office force has departed:

(1) What the top of each employee's desk tells. A desk that looks like a junk heap often reveals a circle of confusion. It indicates overcrowded minutes of the business day which break up established routines, breed pressure, hamper action, and slow-down workmanship.

(2) Examination of desk contents. How revealing this is! Tales of tardy execution and unfinished business of the most urgent nature. Definitely this condition does indicate the lack of efficiency of an employee, but more than likely it is the method of operation that has been the contributing influence.

Human Dividends...

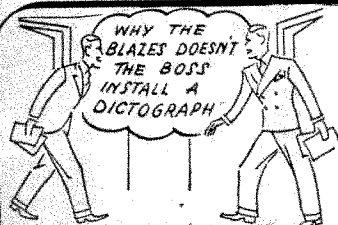


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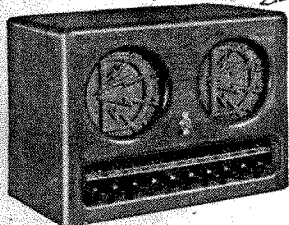
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Report on Office Switchover

By AN OFFICE MANAGER

TO a great number of offices the war has brought many make-shifts, many compromises and temporary solutions to problems. To say there are many misfits is no criticism of workers or management. There were jobs to be done, practically no skilled people to do them. Into thousands of jobs came people poorly prepared by training, experience or temperament. Now, in the interests of economy and sound management, amends must be made.

Before we can fit the job to the person we must know what the job requires. There should be a job description of every position in the office. Briefly, this is what a job description does: (1) Tells what the worker must do, listing each separate task. (2) Describes the knowledge required and responsibility which must be assumed. (3) Describes the skills required. (4) Establishes a range of pay rates for beginners, experienced workers and senior workers in the position.

Development of such a job description for every position in the office is especially important to-day because of the inevitable changes occurring in conversion from war to peace production. Many jobs will change; others will be eliminated; some will be consolidated with other jobs. It may be found that with better job analysis some workers can do work which has formerly been done by two employees.

In job analysis some companies use only four factors, others as high as thirty. The point to remember is to include enough factors to describe the job adequately, allow for judgment, responsibility and the employee's future worth to the organisation.

2.—Find Workers to Fit Each Job

After a job analysis is completed, it may be apparent what changes are necessary in personnel. More than likely there will be a need for transfers, some dismissals and promotions.

But war's end may bring considerable turnover. Women will go back to families, younger workers will return to school, men from the armed services may return to jobs, only to find the jobs are beneath their war-acquired skills.

In the past all personnel work has probably laid too much stress on experience. If we wanted a secretary we looked for a girl who had been doing secretarial work. That is per-



Five First Steps of a Detailed Programme of Office Reconversion

fectly sound, but where we failed was in our methods of determining whether she did good work or not.

More than that, typists' jobs in one office may be wholly different from the typists' jobs in another office. Requirements may be different, environment may be utterly different, standards may be lower or higher.

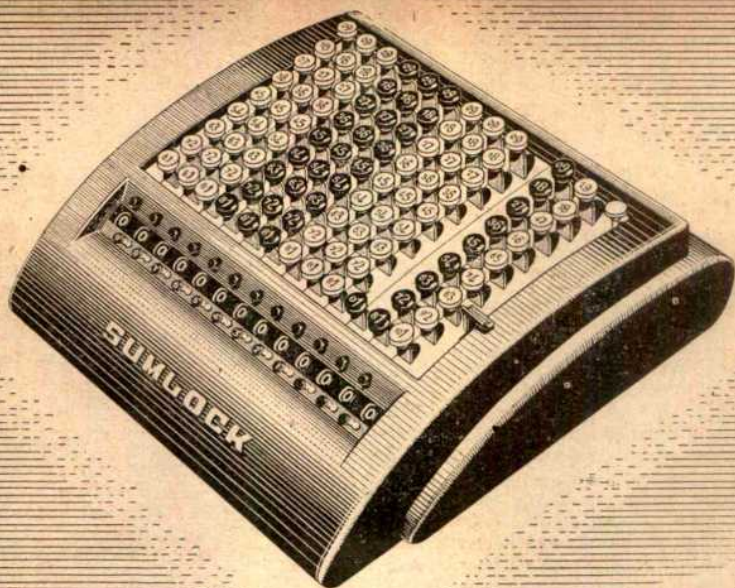
Because all these factors bear on the probable satisfaction of both employer and employee each company needs to pay more attention to finding exactly the right type of employee for each job—employees who are not only fitted by the possession of certain skills, but who are temperamentally fitted for the job.

What we need to remember is that we are now engaging staff with the hope and thought that they will remain with us permanently—some perhaps for the remainder of their working lives, instead of hiring them with the thought that an emergency must be met.

3.—Establish Salary Rates

Coming as it did on the heels of a long depression, the war boom caught many clerical workers in low-paid jobs for which the salaries had been determined almost wholly by depression psychology. When the war boom began first there was a large supply of clerical workers. Workers in other jobs were overpaid. In some organisations it was common to engage new workers at higher rates than old workers were paid for the same jobs. Now the problem is one of making the necessary adjustments, to iron out injustices, to level off salaries; to raise some and lower others.

Once more we need to remember that now we are making what ought to be permanent adjustments, so there is no reason for a hit-or-miss, piecemeal policy of adjustments.



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Every wage rate should be studied with a view towards settling permanent rates which will accomplish the dual result of holding the right employees, paying economically sound rates. It will not be enough to adjust rates to the current levels of community rates, or to attempt to match salaries in some nearby organisation.

Other salaries may be as poorly adjusted, or as badly out of balance as yours. The thing to do is to conduct an over-all study of wage rates and determine what can be paid to attract the right employees.

4.—Give a Proper Incentive

Providing proper incentives is by no means wholly a matter of paying high or current wage rates. It is much more than that.

If, as we hope, there will be a high level of employment for the next several years, workers are still going to be able to do a certain amount of picking and choosing.

They are going to find jobs, not only where the wage rates are fair and equitable, but where working conditions are pleasant, where the tools provided are good, and where employee relations policies are soundly administered.

The organisation without good employee relations policies must be content with employees whom better managed organisations reject. While it is perhaps true the wartime shortages of help led to certain amounts of employee coddling, it is equally true that many organisations which once gave little thought to the comfort, well-being or satisfaction of employees in their jobs, were forced by circumstances, and by good intentions as well, to improve employee relations. In fact, the process had begun before the staff shortage occurred.

Providing proper incentives is a matter of giving the employee a chance to do his or her best work, to advance, to look forward to better jobs, to know a little more than seems necessary about the company's future plans and policies. More than that, it means the employees want assurance that merit and not kinship, politics, religion, or "pull" are the bases for recognition.

The proper incentive for good work is often some plan of recognition of good work when it is accomplished. Here are some checking points worth applying to any office with a management that wants to provide proper incentives: What recognition is offered for good attendance records? What recognition is given for long service? What recognition is given for accuracy? What recognition is given for good production records? Is there any way to recognise the difference between a mediocre worker and an excellent one?

To put it plainly, does the indifferent worker seem to get along just about as well in your office as the ambitious, alert, energetic worker?

Is there some method of recognising and rewarding the clerk who types 40 letters daily as compared with one who types only 30 or less? Plans should be developed which will encourage supervisors and executives to know who is doing the good work in an office and to reward or encourage them accordingly.

This does not necessarily mean a worker be given an increase every time he or she turns in a good week's work. But there are other ways of recognising above-average performances. Items in the house-magazine, notices on the bulletin board or merit marks on the employment record.

5.—Retrain or Instruct Staff

To-day, with the high percentage of new workers in every organisation there are any number of workers in almost any office who do not understand what the company produces; who do not know where its branch offices are; who do not understand how the company's product is sold. One company recently learned that a large number of its employees had never seen its finished products.

How would you like to work all day writing letters about some product which was a complete mystery to you as to how it was used, how it looked or what function it performed? Believe it or not, many employees are corresponding about, billing, charging, posting, filing papers about products, the use of which is a mystery to them.

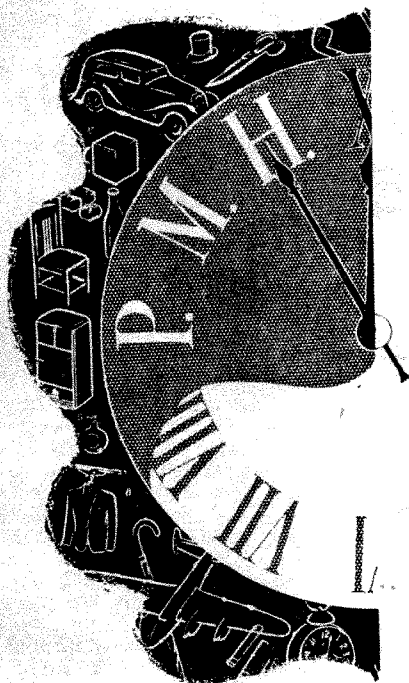
But more important than this, many employees are doing jobs to-day for which they were never trained or instructed. They were simply set to work, told to "watch Elsie," or to "ask Susie if you get stuck," and left to their own devices.

No one had time to show them the right way, to explain short cuts, to encourage them to find better ways. We suggest a study of the operating technique for every job and the development of instruction sheets or manuals for each job, describing the best procedure and a formal effort to teach these best procedures.

There are instances of production increases in simple repetitive office jobs of as much as 100 per cent when simple job instruction training methods are employed. So important is this aspect of office switch-over that we have based one of this month's Short Cuts on the system we describe here.

(To be continued)





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1946 Sales Problem No. 1

Restoring "The Feel of The Job" To Returning Salesmen

By R. M. COOPER, A.A.I.A.

WE enter our first full year of Peace in a World filled with every kind of political and economic unrest, not to mention the vast web of Government controls, plans, or lack of plans, into which the industry of Britain has become entangled. These difficulties have to be faced and overcome.

They are in the main production rather than sales problems, for the market is ready and willing to absorb anything produced, and at prices which, for the moment, recover the cost of some or all of the inevitable inefficiencies of the changeover. We cannot, however, as a Nation or as individuals, afford to prolong this period, and the revision of E.P.T. adds an incentive towards efficiency.

We may best commence with a review of the Company's family tree—Management Audit, to check over men and functions. There are many executives in our industries who are overburdened and feeling the strain of the past years; many too whose departments are out of gear. In many places there is a certain staleness which is not good and a general review and perhaps even some slight redistribution of duties, will re-vitalise the team.

The Low-Pressure Stage

Most firms have men in the services and may hesitate to make changes until these men return. There is a considerable doubt in many minds regarding these, if they have been long away; years and varied experience will have changed and developed them.

In quite a number of cases their allocation from the practical as distinct from the legal point of view may only be provisional.

It is wise therefore, to provide for a settling-in period for many of them so that they can re-adjust themselves to commercial life, and while re-learning the business their new value can be assessed. Many will be real acquisitions, and, rightly handled, most adaptable.

It is possible even in the most difficult cases to re-plan the family tree in, say, two stages, to achieve the best possible by evolution rather than revolution. In this way valuable but stale men can be allowed a period of reduced pressure, ex-service personnel can be effectively accommodated and the final result will provide a virile administrative body.

Office methods will in many cases require revision to cope with the changed conditions of our peacetime production and marketing. New or additional equipment is not easy to obtain but we can re-plan our methods and adjust them in such a way that the changeover to suitable aids and devices, when available, can be effected without disruption. It is surprising how many practises are continued long after their value has departed, particularly where executives have been overloaded with detail work.

Sales Offices in particular will need much attention both as regards equipping and staffing; neither is immediately easy, but plans can be drawn up into which both people and materials can be fitted as they are acquired and a yardstick is provided by which both can be accepted or rejected as they appear.

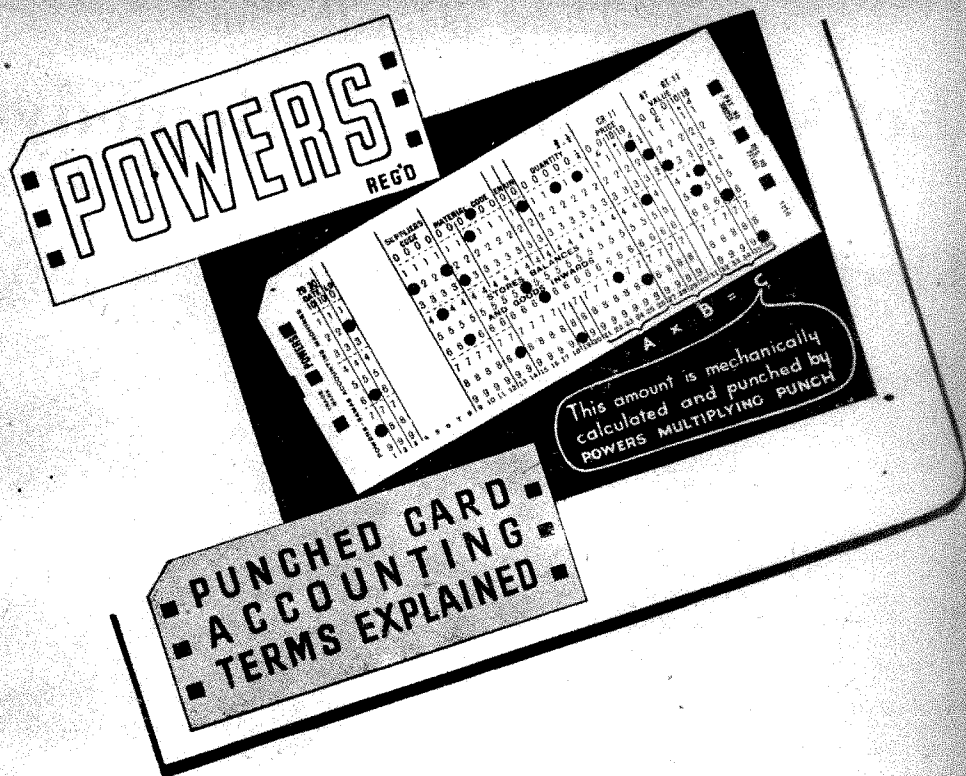
Trained Salesmen Make Sales

Outside Staff become of increasing importance. The better knowledge a man has of his wares, provided he has the other basic requirements of a salesman, the better his chances of success. This knowledge is best obtained on the Company's premises, in factory and offices. How far can he be employed here to help us through our present staffing problems and at the same time fit himself for the road? The question is worth serious study.

To be really effective each man selected should at the same time undergo sales training. Sales meetings would be arranged at which a short talk, followed by a discussion, say two each week of an hour each. The Sales Manager, his assistant, or perhaps one of the Company's representatives visiting the works would speak. Other executives could also usefully provide assistance.

It would be found that the enthusiasm and interest in the work proceeding would assist morale throughout the whole business.

If adopted the scheme should be properly planned to assure that the work the trainees do is of value without them becoming fixtures at any point during their training, also that serious interest is taken in their progress by the Management. If they are viewed as nuisances at any stage then both the administration of the scheme and the man should be examined to rectify matters.



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While There is Still Time Let's Locate and Remedy Our Selling Faults

By V. HAWKE

IN one sense at least, there is no marketing problem for the time being. The demand for goods is so great, the shortages so nearly universal, that the emphasis will remain on production and personnel for a year or two yet.

One manufacturer writes to say: "Please do not mention our new product just yet. The editorial matter we have already had has resulted in enquiries beyond our manufacturing capacity."

The commercial director of another firm writes: "Come and see me in a couple of years' time when things may be a bit easier and stuff may really need selling."

To-day, and for a little while yet, it is a seller's market. But circumstances will change, suddenly perhaps or by imperceptible degrees, and one day the manufacturer who has taken things for granted will wake up and find his competitor leading the field. The moral is to be prepared for the moment when the seller's market breaks, and the interval affords a probably unique opportunity to overhaul the sales organisation.

Diagnosing the Faults

Are there techniques, proved methods, for locating faults in this business of selling, of gearing up the sales machine for its attacks on new marketing records when the right day dawns? A. R. Jackson, in a booklet on "Planned Selling", likens the sales organisation to a system of underground pipes.

"Accordingly," he says, "it is necessary to know that a fault lies under the point of the spade before the digging commences; otherwise much energy and time will be frittered away in profitless searches."

Continuing this plumbing phraseology, Mr. Jackson lists the more outstanding "obstructions, dead ends, and leaks."

The pipes obstructing sales energy, are:—

1. Products unsuited to the customer.
2. Products wrongly priced for the customer.
3. Bad deliveries.
4. Repeat order not forthcoming.
5. Sales promotion material not made use of by retailer.
6. After-sales service inadequate.
7. Tactless handling of accounts.
8. Representative unsuitable.

The dead ends are misapplied sales energy, thus:—

1. Unsuitable retailer or wrong type of user/consumer.
2. Financially unsound customers.
3. Unprofitable transaction, e.g. too costly to obtain or service.
4. Unprofitable territory on short or long term view.

Weak Spots Check-listed

Leaky joints are dissipated sales energy, listed as follows:—

1. Selling time avoidably lost.
2. Dissatisfied representatives.
3. Territories inadequately covered.
4. Irregular follow-up.
5. Retailer, user or consumer, imperfectly sold on products.
6. Unsuitable sales promotion material.
7. Retailer buys but consumer not sold.
8. Opening new accounts but losing old ones.
9. Advertising in wrong medium.

This shilling booklet, published by Kardex, also contains some useful lists of master facts required from sales records, first, if the medium of retail distribution is being adopted and secondly if direct selling methods have been chosen. In the case of retail selling, the master facts that should be available fall under the following headings:—

- (a) Number of customers and expansion potential in each territory.
- (b) Month each customer was last called on.
- (c) Month of last order and its amount.
- (d) Which customers are not buying the range of lines appropriate to their real capacity.
- (e) How many new customers have been added this year.
- (f) How many old customers have not bought this year.
- (g) How many grades 1, 2 and 3 customers are there in each territory.
- (h) How many doubtful accounts.
- (i) How many unsuitable accounts.
- (k) Sales, up, down or normal.

With direct selling to the consumer somewhat similar basic facts are called for, but the differences of detail and emphasis emerge from the list, which reads as follows:—

Please turn to page 108

TOP OF THE LADDER

SHORT SHIFT—

or why Fred didn't make it



Fred and Bert were friends from childhood. And then they wooed the same fair dame. They were running neck and neck. But Fred

lost by a neck—the neck of his shirt, we mean. You see, when Fred got round to popping the question, the words stuck in his throat. His shirt had shrunk so it choked him. But Bert's words were winning ones. His “Rigmel”-Shrunk shirt fitted and flattered. “Rigmel”-Shrunk shirts don't shrink out of fit, you know.



GOING UP. A window-cleaning job is one that takes you right to the top of the ladder. These trim overalled girls do all that was expected of the men in this work—right down to rescuing poor pussy! It is worth noting, that every single week more and more overall wearers (and the grand total is counted in millions) learn to appreciate the comfort and service given by “Rigmel”-Shrunk.

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Nelson, Lancs.

*Booth & Fielding Ltd., Sheffield, 1.

J. Rotherham & Co. Ltd.,
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INDUSTRIAL PRODUCTION EQUIPMENT

Make the Atmosphere

IT is very interesting to see the progress which has been made in the application of suitable air conditioning plant in industry, and the education and information which have been gained in recent years, due to the close collaboration of air conditioning engineers and interested industrialists.

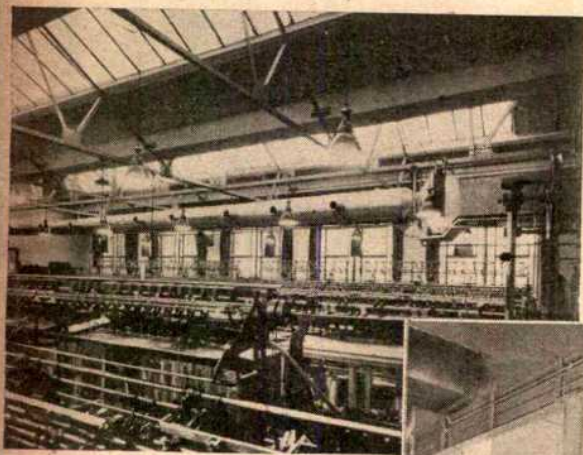
Air conditioning for industry is quite a distinct science from air conditioning for comfort. In the latter one caters, as its name suggests, for clients or users of such places as cinemas, restaurants, departmental stores, etc., and here air conditioning is installed for the health and comfort of the user—with, of course, other incidental advantages; whereas in industry, whilst

these benefits are automatically enjoyed, the primary purpose of the plant is to benefit the product under manufacture. One finds that, whilst the control of humidity is an essential feature of any air conditioning plant, particular attention is paid to the maintenance of controlled humidity conditions in industry.

This is especially the case where a manufacturer is handling a hygroscopic substance. To term a product "hygroscopic" means that it is susceptible to moisture conditions surrounding it. If the product is dry and the surrounding air contains a high vapour content, the product will absorb moisture; when it possesses a high moisture content itself, it will readily lose it to the comparatively dry surrounding air.

One has only to consider the number of industries which are handling hygroscopic materials in some form, during one process or another, to realise the large amount of industry interested in this subject. For example, we have the whole of the textile trade, handling wool, silk, cotton, rayon, flax, jute and hemp and more recently nylon; there is also tobacco, paper, bakery, foodstuffs generally, confectionery and timber.

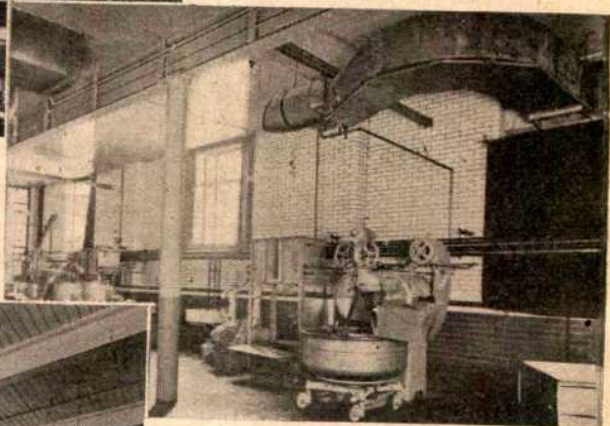
There are the various processes to be considered in any industry, i.e. from



TEXTILES

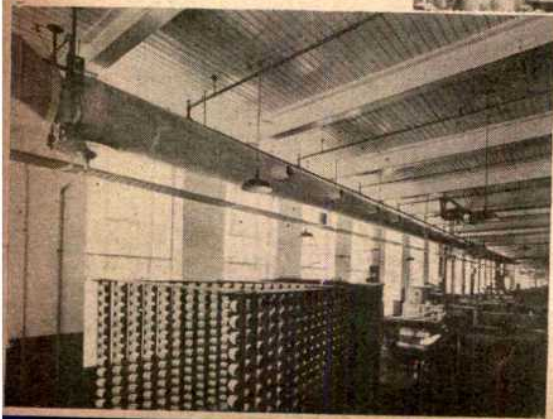
BAKERY

SPINNING



There is always moisture present in the atmosphere and the amount varies and changes constantly; not only from day to day, but from hour to hour. In the textile industry for instance, all fibres, cotton, wool, silk, rayon and the new nylon, are hygroscopic and susceptible to fluctuations of humidity.

In the bakeries it is just as important to ensure comfortable working conditions as it is to maintain controlled humidification. Materials remain good and operatives fit



Meet Processing Needs

By L. G. W. GOSDEN

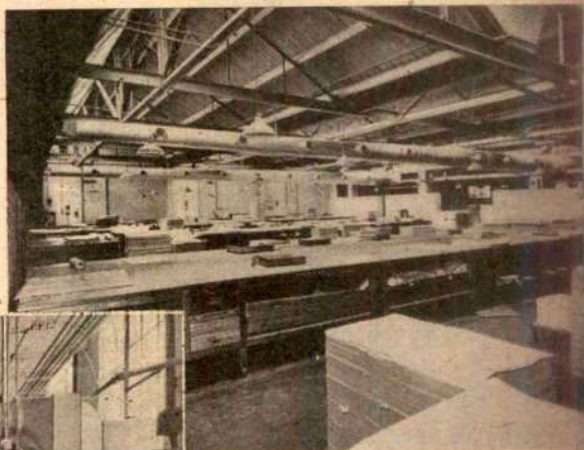
carding and spinning the raw material in the textile industry, to weaving and knitting the finished garments and afterwards the finishing processes after dyeing. In tobacco, one has to consider the various processes from the raw leaf to the finished cigarette or the manufacture of plug tobacco—stemming, stripping, blending, conditioning and storage. In paper, there is not only the paper industry itself, but printing and allied trades and so on through all these various industries.

In all these hygroscopic substances, each product is in its best condition (or in a condition best suited to processing) when it has at least a certain moisture content, or in the majority of cases, its natural moisture content and it is the purpose in installing air conditioning plant, to maintain such a relative humidity in the air that this natural moisture content of the product is maintained within itself.

A simple case, which all will understand, is tobacco, which in perfect condition is easily manipulated during all its processes and eventually evolves as a cigarette which gives enjoyment. Imagine tobacco too dry, and many pipe-smokers will readily appreciate how it

becomes friable—almost as dust—it is useless and an entire waste. One can imagine the position of a cigarette manufacturer in a large way of business on finding his leaf or tobacco degenerating into such a condition.

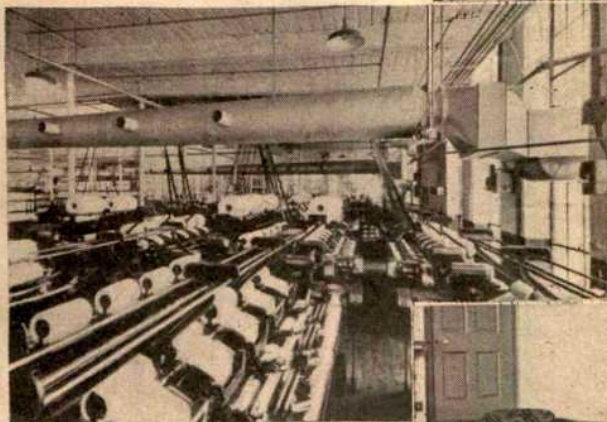
Air conditioning engineers could probably be more easily recognised by a better word—that is, manufacturers of weather conditions. It is possible to maintain any set of weather conditions which a manufacturer may require or find best suited to his manufacturing processes as



PAPER

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In the paper industry and in knitted textiles, the hygroscopic nature of the raw material needs to be carefully watched to prevent process break-downs. Again, the reception room in administrative premises, public rooms and private rooms in hotels and restaurants are enhanced not by the temperature alone but by the nature of the temperature, namely, the atmosphere.



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regards temperature, humidity, air movement and air cleanliness. In the case of temperature, we always find that heating of one form or another is required—and more latterly, the need for temperature control—not only uniformly maintaining temperature, but effecting economies in fuel consumption.

In some products, requiring very rigid conditions (as in the case of testing laboratories, etc.), or in other processes requiring low temperatures, refrigeration may be required, at least for hot summer conditions.

In humidity control, it is found that humidifiers are always required, but sometimes refrigeration is again called into use for de-humidification. It is however the general experience that industry is more in need of humidification than de-humidification, particularly in regard to the more popular type of hygroscopic substances with which one meets.

The capital outlay and the running costs of an efficiently designed plant are a first-class investment for the manufacturer in knowing that, regardless of season and fluctuating conditions, he maintains at all times the weather conditions he requires, under rigid control, in those portions of his factory where his product is to be kept in condition. Not only is one guarded against the various temperature and humidity conditions of the seasons, but also the peculiarities of the English climate.

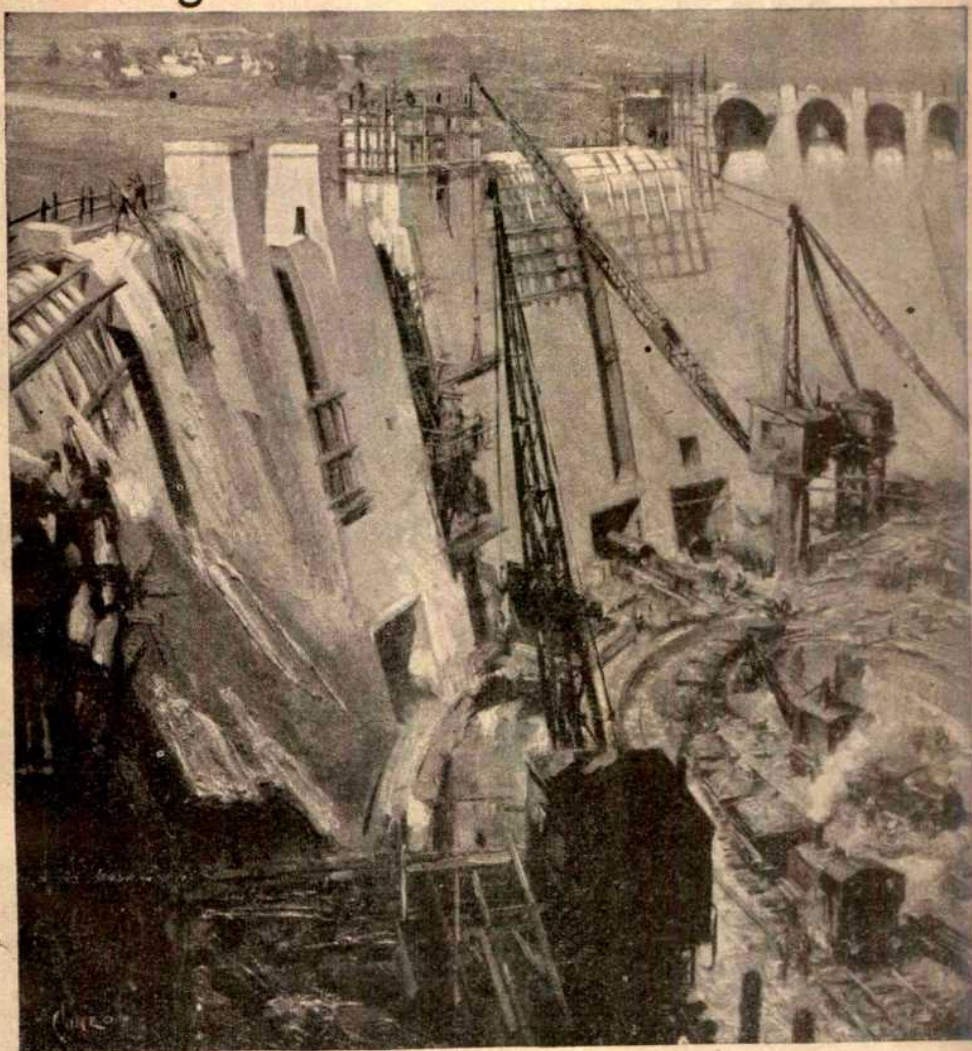
Less Breakdown—More Production

Practical examples of the benefits achieved are that a manufacturer knows that he is able to continue manufacture, regardless of the fluctuations of Dame Nature. In some industries, without air conditioning plant, certain processes have to be shut down during unsuitable natural weather conditions. Apart from maintaining his product in its correct moisture condition, the manufacturer is able to maintain a more even product with increased production, less breakdown and a better finished product with increased sales to the consumer.

In the last four or five years, it has been found that air conditioning plant is being installed in industries for which it was unthought of previously, and it is effecting results undreamed of. We are thinking particularly of trades which, owing to peculiar demands of the consumer, do not permit the industrialist manufacturing over a continued steady rate, but rather that he has previously been compelled to manufacture at headlong speed for protracted periods. Air conditioning and proper air conditioned storage, permit products to be manufactured or collected over normal working periods and stored against consumption.

Experience shows us that there is hardly any industry which cannot benefit by installing air conditioning plant, at least in one of its processes, and when we say "benefit", we mean prove to the user that the capital outlay is an investment which is recovered, in many cases, in as short a period as six months. Industrialists would do well to consider whether the maintenance of certain manufactured weather conditions would not prove to their benefit.

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NEW *For the Factory*

1—Quicker Drilling

HOW one operator can control two, three or four drill attachments mounted on the same table, resetting each drill in turn, has been demonstrated by a firm in the North-West. The pneumatic hand drills in radial arm units speed the drilling of holes in skin plating of any area.

A standard pneumatic drill is adapted to fit into a vertical tubular member at the free end of the steel-frame radial arm, which pivots on a pillar attached to the drilling table. A brass bush fitted to the drill body is an easy sliding fit in the steel mounting tube, and the tube is slotted to allow the projection of two short lifting handles screwed into the brass bush.

In operation these handles are depressed through a bell-crank lever by a long rubber tension spring, thus applying automatic feed motion to the drill. The operator sets a drill over the bushed hole in the template, depresses the air valve, and lowers the drill into position over the hole in the jig. The spring tension

through the bell-crank then automatically feeds the drill through the sheet.

The pressure normally exerted on the drill is about 4 lb., but this can be regulated according to the nature of the work by means of a tension adjusting screw attached to the spring, and in this way the maximum rate of drill penetration for any particular job can be attained.

Apart from the obvious increase in speed of operation which results, it is claimed that there is a considerable saving in drills, as the frequency of breakage is reduced when this device is used.

2—New Cartridge Fuses

MIDLAND Electric Manufacturing Company announce the addition of a range of Kantark H.R.C. cartridge fuses to their products, available in ratings from five to two hundred amperes. Independent tests have shown that they comply fully with the requirements of the specification.

A range of fuse handles is also introduced to carry Kantark cartridges. They have been designed to be interchangeable with M.E.M. standard fuse handles of the re-wireable type without modification to the fuse base. This enables the changeover to be made merely by withdrawing the existing fuse handle and inserting a new cartridge carrier with the appropriate cartridge.

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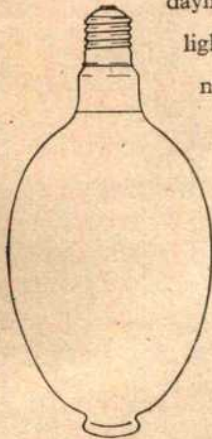


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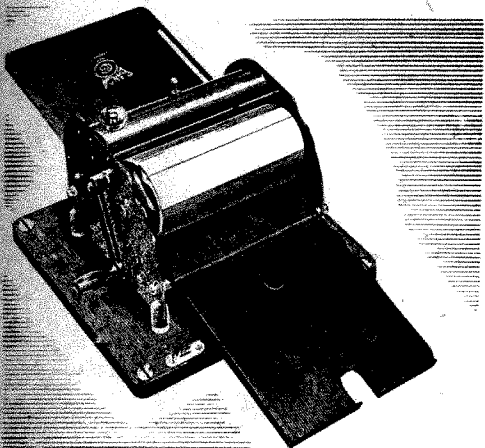
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ridge carriers where necessary. For example, the 100 amp. carrier will accommodate 100 amp. and 60 amp. cartridges by direct fixing, and 30 amp. and 15 amp. cartridges can be fitted into the same size carrier by the use of two adaptor links.

3—It's a Smasher

AGRICULTURE'S need for limestone dust to sweeten land soured by over-cultivation is met by the Gruendler 2 in 1 lime crusher and pulverisor. Produced by John A. Grey and Partners Ltd., this machine is of the down-running type and handles large sized rock.

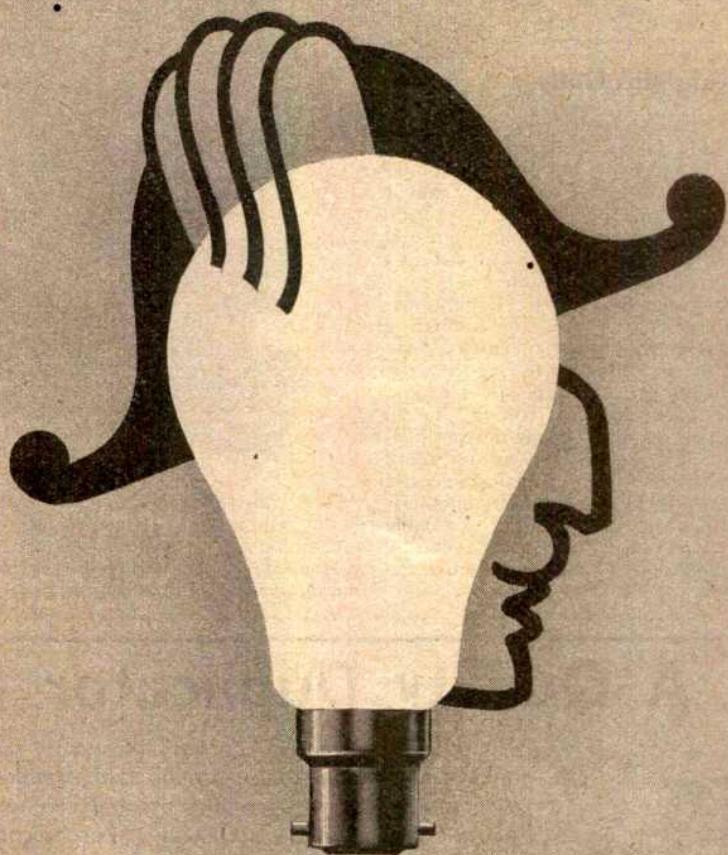
In it the swing hammer principle of crushing has been developed to a peak of efficiency. Hammers contact rock at a high point on the breaker plate to eliminate wear on grate bars. The breaker plate is adjustable. Step-out holes in discs compensate for hammer wear. All working parts are of manganese steel.

4—A Couple of Cleaners

CLEANLINESS is next to godliness. Take note, therefore, of the Multimek fumeless industrial washing and drying cabinet, and the Laycock Engineering Company's new high pressure car washing plant.

The Multimek cabinet is used for washing and de-greasing machined detail parts. The fumes created in the drying process are condensed and purified by the filters and the returning air dries the details. The unit is portable





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and compact, and complies with the Factory Act requirements.

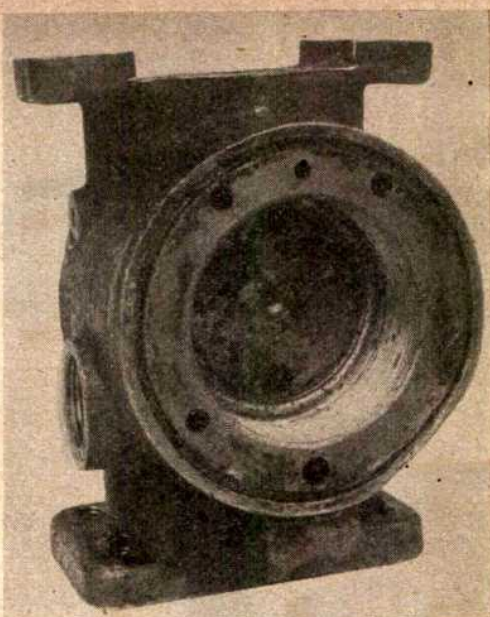
The Laycock plant washes all types of vehicles and has many other uses, such as washing milk cans. The manufacturers, who made parts for Merlin engines and Wellington bombers during the war, are turning them out at the rate of about fifty a week.

5—Reclaiming the Duds

THE loss in time, machine hours, skilled labour and materials resulting from porous castings is only too well known among engineers. Unfortunately, such porosity cannot always be detected until machining has been completed, with the result that many finished products have to be scrapped. In the past this loss has been accepted as inevitable.

A method has been evolved by Commercial Structures (Reconstructed) Ltd. of eliminating this wastage and by which porous castings can be reclaimed. Briefly, the process consists of impregnating the pores with a plastic material under pressure. Subsequent baking in an electric furnace at controlled temperatures converts the plastic into a highly resistant filling which effectively seals the pores against leakage.

P.M.H. being the problem that it is, methods contributing to it merit consideration. Valuable units can be saved from the scrap heap by means of this method. Management must explore its possibilities.



The illustration shows a hydraulic pump body which was found to be porous after machining. The casting was treated by Commercial Structures Ltd. by their plastic impregnation service, and as a result it was reclaimed.

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EQUIP TO SAVE

Materials Time Motion

By F. H. SLADE, F.I.Mech.E.

A BESETTING problem in modern industry is that of preventing waste; waste materials, waste time, waste movement, etc. This fact does not lead into the almost unexplorable realm of higher economics, but constitutes a problem that must be solved by the practical man who has to show a balance on the right side of the profit and loss sheet.

It is in this sphere that an active part is being played by the process engineer, who is daily producing plant and equipment that combines the professional skill of both the mechanical and chemical engineer.

Examples of this type of equipment are solvent recovery plant, wherein it is practicable, for instance, to recover millions of gallons of industrial alcohol at a cost of less than 3d. per gallon, and process handling equipment in which some physical process, chemical reaction or heat inter-change takes place in or materials being conveyed at from a few inches to 40 feet per minute.

Solvent recovery is not confined to alcohol, for solvents also embrace groups known as

esters, ethers, hydrocarbons, ketones, chlorinated compounds and others, while the industries which make use of these low-boiling organic liquids comprise a long, imposing and growing list, such as rayon, rotogravure printing rubber products, lacquer coatings, artificial leathers, linoleum, phenolic resins, dry cleaning, spraying paints, etc.

It is of interest to consider examples of these industries wherein advantages are taken of waste prevention and materials movement to effect considerable costs reduction.

PAINT RECOVERY. The recovery of paint from over-spray in watertype spray booths is a feasible proposition, especially as regards lacquers. When this material is mixed with water the resultant sludge is not sticky, having no adhesion to walls and pipes and is easily collected, dried in a centrifugal drier, redissolved, clarified, etc.

Alkaloyd resin and urea-formaldehyde resin enamel finishes present a more complex problem because enamel sludge is sticky, and the correct compound must be found for any par-

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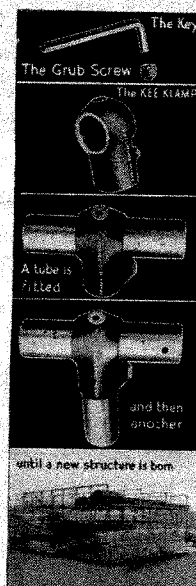
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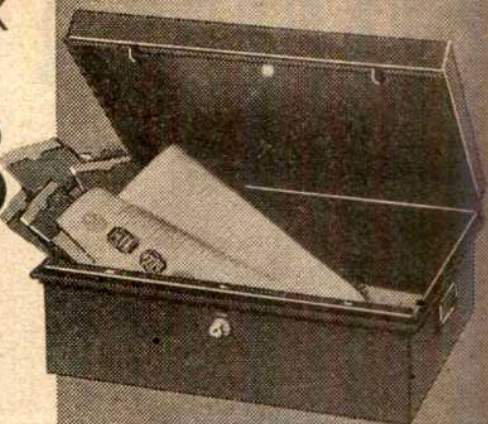
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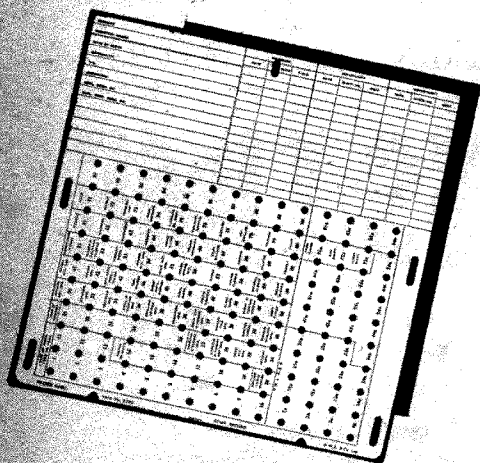
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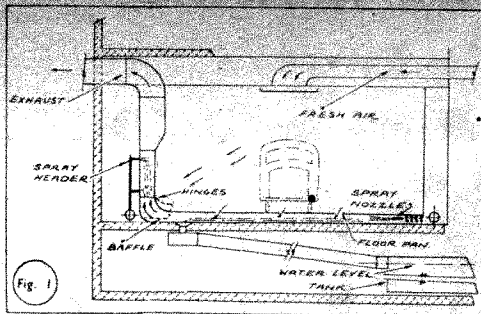
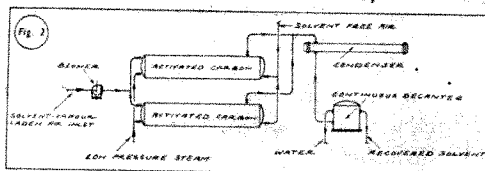


Figure 1 illustrates the layout of an Automobile Paint booth equipped to give clean working conditions and economic Paint Recovery. Figure 2 a flow chart of the solvent Recovery Plant



ticular enamel finish to effect complete reclamation. Water alone does not wet the paint particles, and any water film has insufficient film strength to form an envelope around the particle which cannot be ruptured by the pressure of the particle against the wall of the booth or of one particle against another.

It is necessary, therefore, to find a method of forming a water film around the paint particle, and to have this envelope act as a carrier for some material which would either lubricate the paint particle or otherwise prevent it from adhering to the booth surfaces.

Caustic alkalis and some of the salts of the alkaline earth metals and aluminium will form a protecting envelope around the paint particle which will prevent it sticking to the booth surfaces, but it does this at the expense of the recovered material.

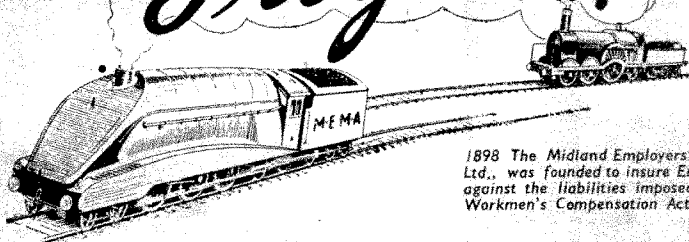
Because of this it is desirable to use a compound which has little hidden power so that it would not change the colour of the recovered material, also that it will remain in suspension for several days and any settling will be put back in suspension when the water medium is recirculated.

Since no material will stay in colloidal suspension by itself unless it is very small in particle size, some protecting colloid must be used so that less expensive materials can be utilised for the suspended material.

A basic requirement of the protecting colloid is that it should carry the same particle charge as the charge of the booth surfaces and opposite to that of the suspended material, so that the particles will repel each other and tend to maintain suspension; while in order that the quality of the recovered paint is not seriously reduced it is also essential that there will be no decomposition or other chemical change because of the materials used.

As already stated, centrifugal drying is re-

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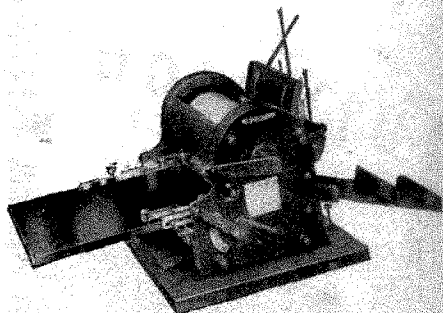
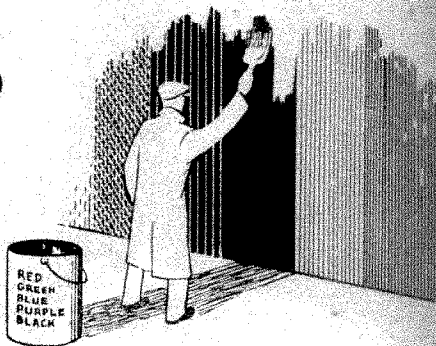
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sorted to for lacquer recovery, however, for urea-formaldehyde resin enamels the recovery process changes from the straight heat-mixing-water evaporation process to the full vacuum method until the water is reduced to about 1 per cent, followed by reduction, clarification, etc.

One of the essential features of successful paint recovery is correct spray booth design. Figure 1. illustrates a well-designed booth used for automobile body painting; in this, spray nozzles situated underneath the operator's working position are distributing wash-water under force along the floor-pan which has been given a definite slope.

Every part of this floor-pan is wetted with high velocity spray in the form of a curtain, the mixture flows to the other side of the booth and enters a pipe which is sloping all the way to the main collecting or sludge tank.

Air enters at ceiling level, collecting surplus paint spray, away from the operator, in its passage to the air exhaust duct. The air-paint mixture passes through a curtain comprised of an enormous volume of wash-water, in which the paint is removed from the air stream. Besides lacquers and synthetic enamels; oil base undercoating, aluminium paints, etc., may be successfully reclaimed.

Recovery Methods Cut Costs

INK RECOVERY. The ink used for roto-gravure printing is manufactured in the form of a thick paste, being thinned down to the correct density by a solvent. It is estimated that over 80% of the solvent used is wasted unless some means of recovery is adopted.

Almost all of these solvents can be recovered by employing an activated carbon absorbant to pick it up from the exhaust air. The absorbed solvent is then steamed out of the activated carbon and made suitable for re-use.

The inks used in modern high-speed roto-gravure work contain a mixture of valuable volatile solvents. Some of those commonly employed are ethyl acetate, isopropyl acetate, acetone, ethanol, benzene, naphtha and other hydrocarbons.

In the roto-gravure printing process, paper is passed at the rate of 1,000 to 1,500 f.p.m. It goes through driers, where a large percentage of the solvent is vapourised by air brought down in turbulent contact with the surface of the paper; air thrown in by a blower at each unit.

The vapour-laden air passes through branch ducts into a main duct having a large exhaust blower at its terminal. The discharge from the main blower delivers the vapour-laden air drawn from the roto-gravure process to the solvent recovery absorption units, while a large filter removes all dust and dirt from the air before it reaches the recovery unit.

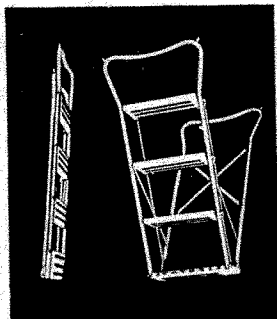
When the carbon is fully charged, as indicated by a definite service period if air is delivered at a constant rate, or by an indicator if at a varying air flow, the absorbed solvent is driven out of the charged carbon bed by introducing low-pressure steam at a controlled rate.

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Planning prosperity is not enough. It must be striven for with the same tireless energy as won the war.

A leading factor in Britain's prosperity drive will be rail transport, fetching and carrying for commerce as it did for victory.

Ports, factories, mines, mills, farms, markets, industrialists, consumers—all must be served and will be served by the railways.

The switch-over from war to peace on the railways, as in every other industry, is bound to take time.



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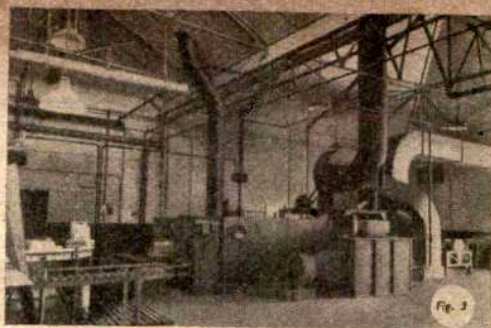
for a pre-determined time below the carbon bed; after which the absorber is ready for re-use.

The steam passing through the charged carbon bed causes the release of the absorbed solvent and then the steam-solvent vapour mixture passes out of the absorber and into the condenser. The recovered solvents are dehydrated on leaving the condenser and made ready for re-use.

A simple flow chart for solvent recovery is shown in Figure 2, where it will be noted that a continuous decanter is indicated for solvent separation; this method is possible if the solvent is not appreciably soluble in water. However sometimes the solvent is a mixture consisting of both water-soluble and water-insoluble solvents and hence requires both decantation and special distillation.

It is of interest to note that this method of solvent recovery can be used to advantage in the following processes—rayon and other synthetic fabrics, manufacturing and applying plastics, moisture proofing of transport wrappings, lacquer-coated or impregnated fabrics, artificial leather, book bindings, degreasing of metals, collecting solvents from fermentation gases, spraying automobile bodies and similar coatings, and an almost endless number of other uses.

The foregoing are two very illuminating examples of where considerable waste of materials has been prevented in manufacturing processes and constitute processes that may be applied to a number of industries.



How a vital war job was speeded up.
The Gas-fired dry-off oven after testing,
with cooling tunnel at the Jerrican
Painting Plant

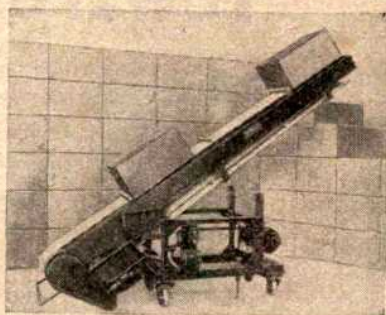
There is still the all-important problem of time-waste that is receiving everyday attention, and much of the equipment that was brought to fruition by the need to conserve man-power during the war period will be of infinite value during the struggle to compete favourably in the overseas markets in the future.

The portable petrol container known as the "Jerrican" was produced to withstand the hard usage of modern warfare without fracturing and causing a waste of valuable petrol and material.

An essential feature of these containers was that both the external and internal finish had to be sufficiently hard and resistant to protect

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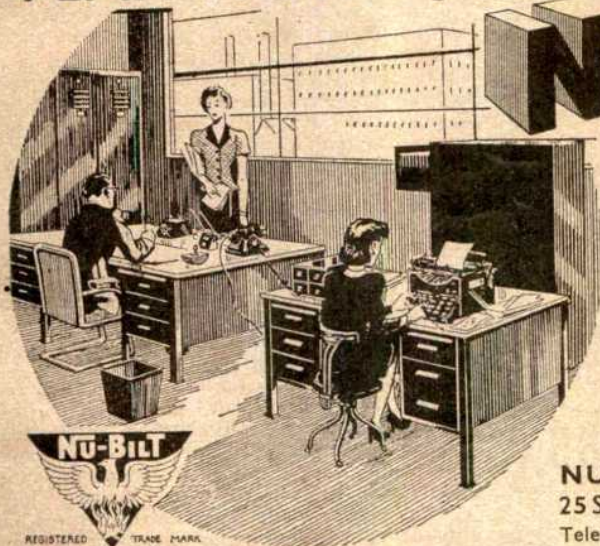
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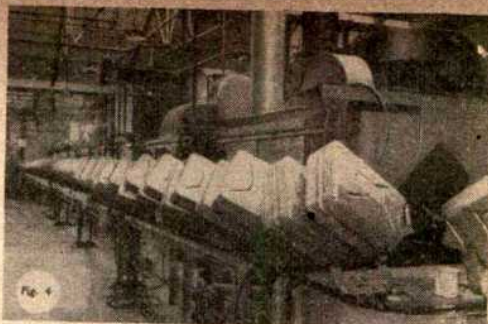
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Jerricar flow along the conveyors.
Illustration of Gas-fired internal coat
draining and drying plant

the steel body and welded joints against rough usage and corrosion.

This meant that the material had to be a synthetic enamel, which, in turn involved a stoving process with temperatures much higher than would be required for the drying of paint.

A paint-drying plant to effect these ends, and embracing the most modern concepts of process-handling in order that the container should be finished on a gigantic mass-scale in the shortest possible time was designed, and installed. The drying processes were carried out in three phases, which were:—

1. Dry-off after water test, for 3½ minutes, at a temperature of 375/400°F.
2. Flash-off of inside coat after internal paint spraying, for 5 minutes at a temperature of 300/400°F.
3. Stove external coat after paint flowing for 20 minutes, at a temperature of 350/375°F.

These three distinct phases in the drying process were carried out at the exceedingly high rate of 2,000 cans per hour in three types of continuous conveyor-type ovens. Bottle-necks between these highly efficient producing units were eliminated by conveyors planned to maintain an even and adequate flow of materials to and from each unit, so allowing it to work up to maximum capacity.

On completion of fabrication the cans are fed by roller conveyor to the tank test, from which all passing inspection move on to the Dry-off oven travelling through this by power-conveyor for a drying period of 3½ minutes, after which they pass to the adjacent cooling booth. This oven and cooling booth is shown in Figure 3 and is equipped with a conveyor of the Floor-line Cross bar type, whereby six or more cans are conveyed in a row.

Figure 4. illustrates the gas-fired internal coat draining and drying plant, from which it will be seen that the cans are conveyed through the inner coat process or a Floor-line conveyor fitted with special jigs to hold the cans inverted at a suitable angle for internal spraying; these jigs are then tilted automatically to set the cans at the best angle for draining before entering the oven.

[To be concluded]

Illustrations by courtesy of Heat & Air Systems Ltd.

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Light-up for Better P.M.H.

THERE are a number of operations in the hosiery industry that demand not only manual dexterity and good eyesight, but also the best possible working conditions. "Linking," "mock-seaming," "welting" and "toe-finishing" are some that fall into this "fine-work" category. Although none of these operations necessitate working to the fine tolerances to be found in precision engineering work, it is

nevertheless work of a very exacting character.

Linking, for example, involves the threading of every single stitch round the toe of a sock or stocking on to a revolving disc round the periphery of which are scores of "points" per inch of the periphery, varies from one machine to another according to the class of sock or stocking being made. Thus, men's socks, which are more coarse in weave than, say a lady's stocking, are "linked" or machined on the



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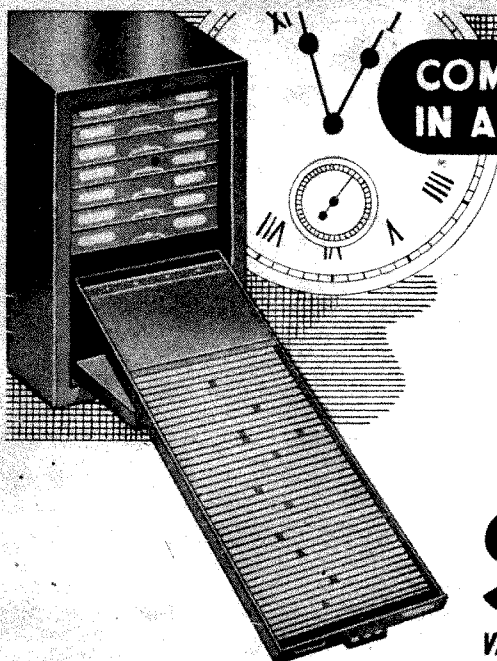
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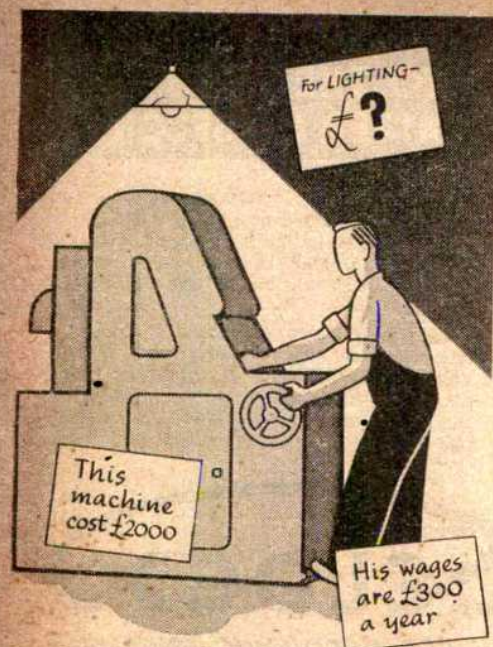
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5. Can also be used for dry scrubbing or converted into a floor polisher by interchangeable brushes.

There is also the Dixon Power Suction Squeegee. It sucks up the dirty water and leaves floors clean and dry.

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... but how much do you spend on lighting to make man and machine more efficient?

Even in factories where the lighting is regarded as good—a replanned system of lighting can speed up production, reduce fatigue and cut down the accident rate. It is not always a matter of having brighter lights. Scientifically resiting the existing installation will often give more illumination where it is wanted, with less glare and no interfering shadows. The facts given above, while hypothetical, are based on actual experience, and well illustrate the benefits that planned lighting can bring.



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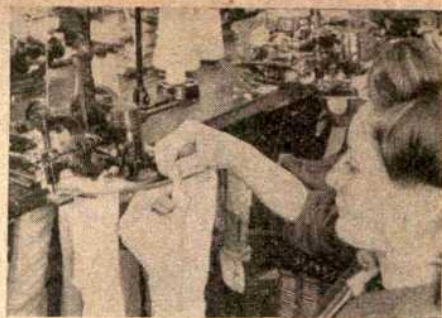


Fig. 2.—Showing the linking operation in detail

coarse gauge linkers and the ladies' hosiery on the finer gauge linkers.

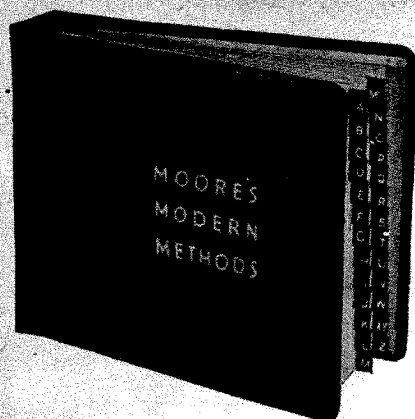
Some idea of the skill and dexterity demanded of the operators may be gained by the fact that it takes about four years of experience on the linkers before an operative becomes really proficient on the fine-gauge machines. An operative's first introduction to linking is on the coarse gauge machine, and as she becomes thoroughly conversant she is transferred (vacancies permitting) on to finer gauge machines until, eventually she is transferred to a machine embodying the largest number of "points."

Machines of this type can be seen in the foreground of figure 1, which is an illustration of a machine room in a large hosiery establishment of Messrs. Wolsey Ltd. Figure 2 is a close view of a linking machine, which, although it is used for hosiery of less close weave, shows quite clearly the details of the linking operation and the type of machine employed.

That fluorescent tubes are used to provide the illumination for operations of this kind is sufficient testimony to the quality of the light they give. Not only is adequate intensity necessary, the illumination must be as free from deep shadows as possible and because of the high reflectivity of the materials being worked and the possibility of specular reflections from the polished surfaces of the machines, a light source with a low surface brightness is essential. This shadowless lighting has an intensity of 50 foot candles at the working point.

Figure 3 is of another section in the same factory devoted to "mock-seaming" and "welt-ing." In both these operations electrically driven machines working at high speed are employed. Here again, good seeing conditions are paramount for sure and speedy manipulation of the garments. Indeed, so quickly and rhythmically do the girls work that their actions seem almost mechanical, and this is without the aid of "needle-lights," which are usual adjuncts to machines of this type. Such speed and sureness would be impossible had the girls to contend with indifferent lighting conditions—deep shadows, glare and their attendant ailments, headaches, and ultimate eye-strain.

The tubes lighting the linking machines are mounted slightly behind the operatives, in close formation running parallel to the machines.



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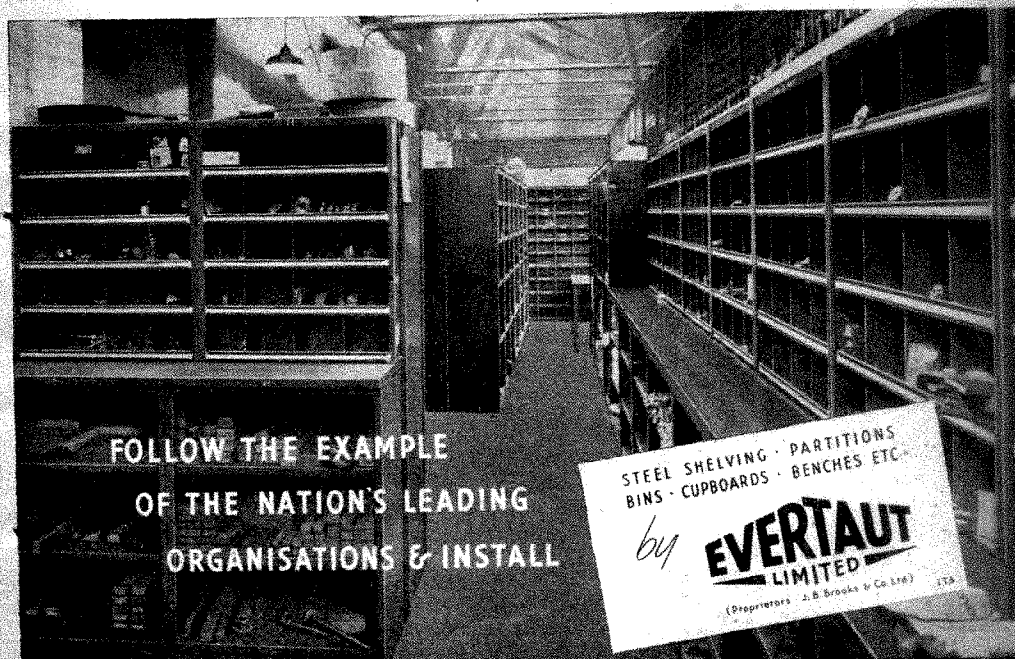
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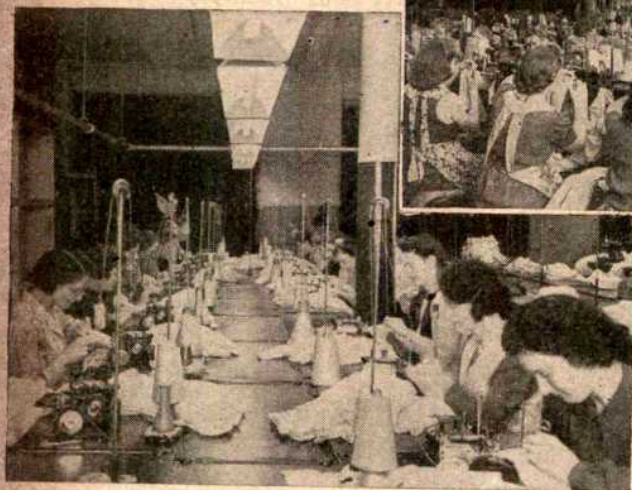
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planes are evenly illuminated. In other sections where work is mostly on the horizontal plane, the tubes are mounted centrally (see figure 3) over the machine tables.

There is little doubt that there will be an abnormal demand for wearing apparel of all kinds in the



Fig. 1.—Above, fluorescent tubes give no-shadow light over the linking machine.
Fig. 3.—Another section, same factory—mock welting and seaming



immediate post-war years. None realise this more than the manufacturers themselves, who, so far as is possible at present, are making plans to meet the situation.



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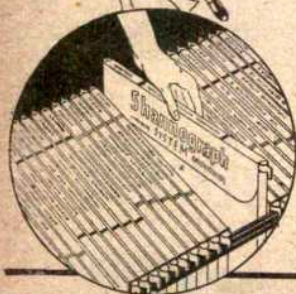
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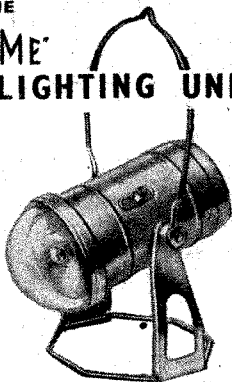
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As in many other industries, the condition under which operatives in the textile trades have to work have steadily improved despite the impositions of war—the blackout and longer working hours.

Perhaps more than any other factor, the blackout, distasteful though it has been, has proved a blessing in disguise, in so far that it has brought home to the government and employers alike, the necessity of lighting for the maintenance of a high and consistent level of production.

In those factories responsible for the clothing of the men and women of the forces, and in others supplying utility clothing to meet the needs of civilians, improved lighting conditions have led, not only to larger output, but also to a measurable improvement in the general health of the personnel.

One such establishment where better lighting has brought forth praise from the management and operatives alike, is shown in the illustrations.

This shows part of a factory in the North of England engaged upon the production of utility clothing under Board of Trade auspices. Experience has proved that the characteristics of the fluorescent tubular lamp are particularly suitable for this class of work. In particular, its ability to provide high intensity light with virtually no shadow or excessive heat, are most valuable features for the prevention of eye-strain, headache and consequent fatigue.

This installation comprises eighty-six fluorescent tubular lamps in five rows of continuous troughing. They are suspended 10 feet from floor level (i.e. about 7 feet from the sewing benches) each row being spaced 8 feet 6 inches apart. The lighting intensity on the working plane is 25 foot candles.

So successful has this installation proved that similar lighting improvements in other parts of the factory are being carried out and, as in the present case, the whole of the installation work is being carried out by the firm's own engineers and maintenance staff.

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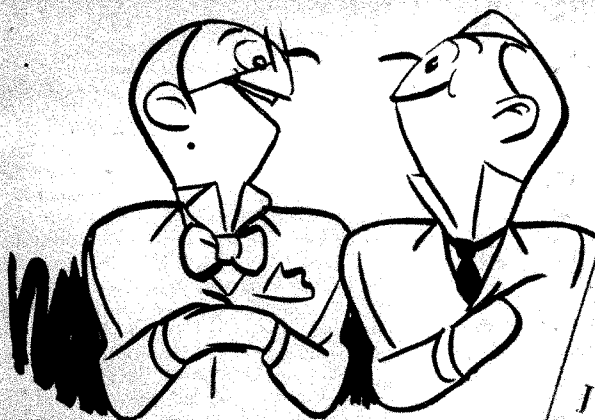
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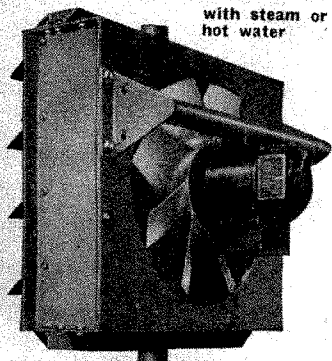
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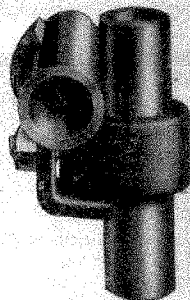
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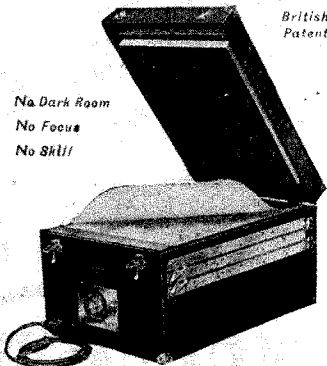
The increasing demand
necessitated by the
War effort
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P. M. H.

Continued from page 40

"As a nation, we are learning all too slowly that a good aircraft designer is not necessarily a good managing director of an aircraft manufacturing company, that the best salesman is not always the best sales manager, and that a good craftsman often makes an indifferent foreman.

"Whilst it is highly desirable, all other things being equal, to promote from within and to build people up from the lowest ranks in industry to the highest, it is absolutely essential that every move upwards must be preceded by fresh training for the higher job.

"Too many works managers of engineering shops read a lot of material about engineering and nothing about management; too many chief designers learn a lot about the products they are designing and nothing about the handling of their drawing office personnel. It is necessary that our management personnel should supplement their generally extensive knowledge of industrial processes by keeping up-to-date with the techniques of industrial management and the science of industrial economics.

"Until they do this, there will be far too many decisions made by rule of thumb. New machines will be purchased when the works manager happens to notice they are a bit rickety or when there happens to be a spare couple of thousand pounds in the bank, instead of at the point at which the curves of output and of capital cost cross one another; new salesmen will be appointed because a few orders happen to drift in from a certain area instead of on the basis of scientific market research; and men will be appointed to positions because they happen to apply for them and to be available, instead of on a factual correlation of job analysis with an assessment of personal qualifications.

"A better-trained management will realise the need for better training of the operative personnel industry. With the exception of a handful of enlightened firms, most businesses teach their processes to new entrants by methods which have long since been discarded in all other forms of teaching. Far too much time is spent by boys coming into the factory in watching other people do the job instead of being shown how to do the job.

"Even in the case of some firms which have initial training schemes and apprenticeship schemes, a great deal of knowledge is still imparted by taking the lad to a craftsman and telling him to watch what Bill is doing and to learn to do it himself.

"Generally, Bill the craftsman is selected because he is the best operator and not because he has any aptitude for teaching. Generally, too, he is being paid on some form of bonus system as a result of which every time he stops to instruct the new lad he is losing money.

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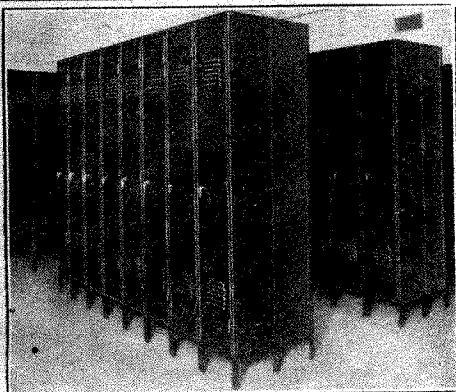
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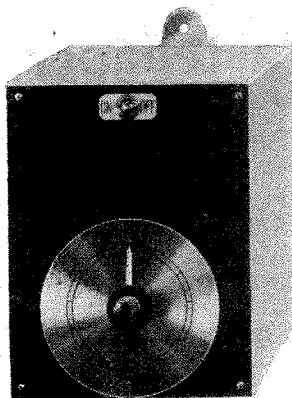
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"Moreover, it does not always follow, as motion-study experts will readily testify, that the man who has the reputation of being the best craftsman in the shop is necessarily doing the job in the best way, for often he gets his reputation as the result of using high natural aptitudes to overcome the effects of unscientific methods. Putting a lad to watch such a man results in a system of perpetuation of error; young Tom learns from Bill, as Bill learned from Arthur, and Arthur learned from Tom, and Tom learned from Harry—and Harry never knew in the first place!

"In spite of these handicaps, however, the level of efficiency of processes on the factory floor is a great deal higher than in the ancillary processes which go to make up manufacturing organisation.

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"Unfortunately many of the improvements so effected have been partially or wholly offset by increases in the cost of ancillary operations.

"The time office, the wages department, the works office, the stock control department, the stores, the costs office and others have eaten up the gains achieved by the designer, the planning engineer, the works engineer and the operator.

"Economies in the consumption and movement of material have sometimes been offset by sharp increases in the consumption and movement of paper. All this lies at the back of the repeated increases in oncost percentages, which in many firms have now reached 400 or 500 per cent of direct labour. Whilst an increase in oncost percentage is not necessarily a sign of waste or inefficiency, it is clear that a ruthless examination of the constituents of these percentages will reveal many wastes of increased P.M.H. in ancillary operations.

"These are not the only fields for investigation, but I suggest that they are the ones which will show the most marked and most immediate results. It is, however, necessary to add a word of warning that P.M.H. is not the only ingredient of industrial effectiveness.

"It is altogether desirable that we should seek to root out waste of labour, and of course waste of materials and capital as well; but the greatest waste of all is the waste of end-products, since this wastes labour and material and capital all at once.

"The greatest losses in British industry arise from failure to correlate production and consumption, and from devoting manufacturing genius to making things that are not wanted or anyhow will never be used.

"Until we get a condition in which increased P.M.H. results in more goods in people's homes and not merely in more goods on shelves in factory stores and warehouses and shops, we cannot claim that we are making the best use of technological progress."

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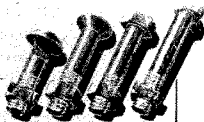
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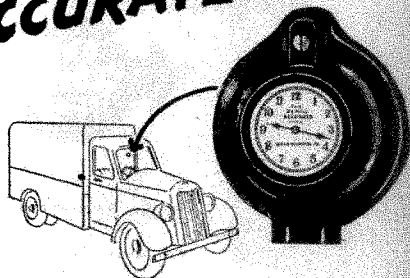
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PLAN ACCOUNTS

Continued from page 62

completely erroneous inferences to be drawn from such accounts which have been carelessly constructed. Except for appropriations of profit, dividends received and exceptional receipts and payments all other receipts and payments are trading items so why not put them all in to one account properly called a "Trading" Account instead of making a purely arbitrary division between various items of expenditure.

The Trading Account may properly be divided into Manufacturing and Trading sections, but such a division has a definite basis for so doing. Assuming that this is regarded as unnecessary in a particular case, the Trading Account which I use would contain the following items:

DR. Cost of Materials and Finished Goods Used.

Production Labour.

Manufacturing Expenses.

Maintenance Expenses.

Distribution and Selling Expenses.

Commercial Expenses.

Financial Expenses.

CR. Sales.

Increase in Finished Goods Stock.

The balance on this account is the profit or loss on trading, and the figure called "gross profit," which is calculated on a different basis in practically every business, is eliminated. The margin at the prime cost stage or any other for that matter can be easily ascertained.

Value of Comparative Statements

It will be seen that the figures produced from the financial accounts will tie up much more closely with those shown by the costing records and that extraction of percentage comparisons is a very simple matter. When comparing records of different periods it will be found of great advantage to compile a comparative statement showing each class (or each item if desired) of expenditure as a percentage both of turnover and production labour. In this way a running commentary and check can be kept on overhead figures thus enabling costs to be more accurately estimated—particularly if short period accounts (one, three or six months) are made up.

Accounts of this nature possess infinite possibilities for variation and sub-division. Comparative figures for branches, departments or products, etc., can be obtained with ease provided provision is made therefore when the plan is drawn up, and are of real value because the standard design is used in each case and the figures have a common basis of comparison.

Within the limits of a short article it is not possible to give more than a brief and condensed review of the subject. This review is sufficient to show however, that much greater and more efficient use can be made of basic accounting records which every organization large or small must keep in some form or another, provided such records are given a little more attention and are properly planned to suit the requirements of the particular organization.

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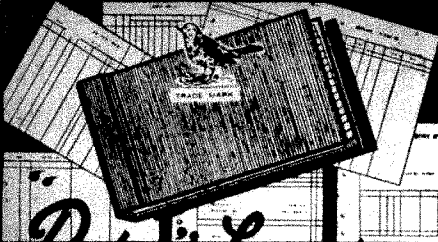
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Continued from page 72

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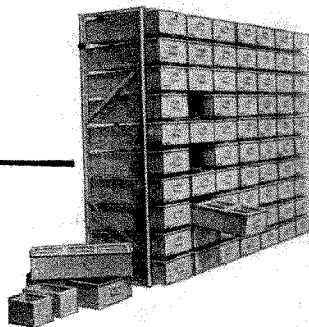
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Health- in Industry



How We Can Signpost The Goal to Industrial Endeavour

By A CONSULTING PHYSICIAN

IN this, the last of a series of three short articles on industrial discontent, a few suggestions as to the means of preventing and alleviating such a state, will be brought forward.

One thing must be admitted at the outset: it is that there is very general agreement about the ideal goal of human effort. For some thirty centuries, mankind has looked forward to the time when there will be justice, brotherly love and liberty throughout the world, to the time when nation shall no longer lift sword against nation, and human group shall live in amity with other groups.

But, with all this good will, disappointment has come time and again. Not once or twice, but many times, the millennium has been ushered in by bigger and better machinery and more intensive centralization; but the new day that dawned was not the millennium: first it was the war, and now it is the troubled peace.

Where, then, with so much goodwill, has been the flaw?

The answer, succinctly and rather inadequately, is that the human factor has not been given as much consideration as has the mechanical one. And, if we are to have a happy working community, we must turn our attention to that important subject.

In the two previous articles we have discovered some of the factors that lead to discontent, both in individuals and in industrial groups: we will now turn our attention to the eradication of these factors from our society. And let it not be asserted that it is impossible to do this; it may be difficult but it is so essential that we must find a method of doing it, if our industrial civilization is not to perish as a sacrifice before the Juggernaut car of the machine.

First, let us try to clarify the problem by determining what it is. We might attempt to discover how and why discontent has arisen in certain groups, as we have in fact done in the

earlier articles; or we might investigate the groups in which discontent is slight or even unknown. It may then be possible to infer why the members of the latter groups are well-adapted to their environment; and, if this can be done, it should not be an insuperable task to apply this knowledge to less-contented sections of the community.

It is certain that the size of the income won by people is not, at least alone, the cause of happiness or of discontent, always provided that the basic necessities and the reasonable luxuries of life are freely available.

If I may be permitted to choose an example from my own profession, it will help to clarify the issue. Thus, the newly qualified doctor, who gets a job as house surgeon in a hospital, is paid something under two hundred pounds annually, but he is, as a rule, a happy man; his creature comforts are moderately well provided for, and his job engrosses him.

By Way of Comparison

Some day, he will want more money, partly because he may wish to marry, partly because his tastes become rather more sophisticated; but there is no doubt whatsoever that the majority of these young men have not the least desire to make enormous incomes, nor are they jealous of the few prominent physicians and surgeons whose names are household words and whose incomes are proportionately large. No, they are people whose job is, to them, a joy, and whose emoluments are sufficient for their needs, although, of course, a little more never comes amiss.

You may assert that doctoring is an interesting job in itself and that it is, therefore, unfair to select it as an example of a career in which discontent is uncommon. There is, admittedly, some truth in this, but not, I think, a great deal, because examples from other professions and trades can easily be found. For instance, the

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W36a/303

craftsman who makes boots and shoes by hand, is not a discontented human being; and even the little man who repairs them is also a well integrated human being.

But, when we come to look at the man or woman, whose job it is to tend a machine that cuts out or sews some part of a boot, discontent is common, if not universal.

It would seem reasonable to look further into these differences in the hope that some point may become clear as an explanation of the genesis of discontent in certain types of workers. Now, if we examine the work of the general practitioner of medicine, we note at once that the doctor understands clearly what he is aiming at; he envisages the end, which is the relief of his patient's disabilities. But he does not necessarily assume that he himself will be able to deal with each and every kind of malady that may present itself. He knows that there are many occasions when he will require the advice and assistance of a consultant, whether a physician or a surgeon.

An Industrial Analogy

One of the general practitioner's most important jobs is to know when he is out of his depth and who is the best second opinion to call in. But, let it be noted, this does not in any way damage his self-esteem; in fact, it gives him confidence in his own acumen and judgment.

There are similar features in connection with the work of the maker of bespoke boots and shoes. As a rule, he can tackle the job, but there are some feet with such peculiarities that the specialized skill of the surgical boot-maker is required; and nobody will think the less of the bootmaker who honestly tells his customer that so-and-so is the right man for this particular job.

Similar circumstances develop in the work of plumbers, carpenters, cabinet makers, and innumerable trades; and, in each instance, the customer thinks the more highly of a man who plainly says that the job is not for him, while, at the same time, the worker has the satisfaction of knowing that he has given the best advice.

At first glance it may seem that there is no analogy between such conditions and those that characterize industry as a whole, but, if that is so, one must assert that it is the worse for industry as a whole. On the other hand, if, as I believe to be the case, there are analogies, we may be able to transfer to the factory worker some of the benefits of craftsmanship.

If one considers the big order that comes to the factory, the first thing that is obvious is that it has to be broken down: this goes to that department, this to another, and so on. And what is perhaps most significant of all, some things may have to be farmed out beyond the factory itself. For instance, the printing of labels may be handed over to some little firm of printers, whose charges for the work will form part of the total cost of executing the order.



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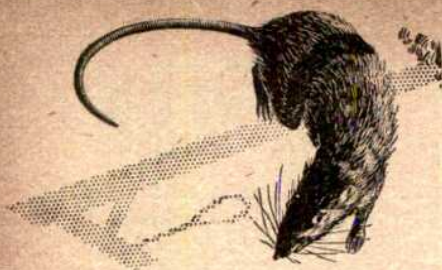
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It is a matter of common observation that, if there is going to be labour trouble over the job as a whole, it will not be in the little printer's shop but in the main factory. And some people have gone so far as to draw the inference that labour unrest is an inescapable defect of large-scale undertakings.

Such a contention cannot be accepted, because careful thought, bearing in mind the main principles of psychology, demonstrates clearly that it is not size, but the submerging of the individual in the mass that leads to that discontent that has its roots in frustration.

If it is possible to break down jobs in such a way that some of the work is given to autonomous groups, as, for instance, small printers in the example just cited, it is surely possible to pursue a very similar course within the factory-group.

We still speak of the tool-shop in a large engineering concern, but we tend to forget that it is, in no real sense, a shop; it is inextricably fused with the main working group, that is to say, with the business as a whole. But this was not always the case: in the past, the tool shop was in a real sense autonomous, and the workers in it possessed some sort of power of bargaining with those who required their products.

In this way they were in much the same position as the little printer mentioned above, whereas to-day they do what they are told (or they jib at it) in return for a wage, which diminishes their freedom as individuals, without appreciably increasing their degree of security in the labour market.

One more example may be useful before we try to draw some conclusions from our discussion. It is probably cheaper and it is certainly more efficient if a chain of restaurants possesses a central bakery of its own, instead of getting its bread from other bakers. But, as we have already seen, man does not live for efficiency as an end in itself; and to drive small bakers out of business or into a lower category because of worship of an entirely non-human goal, efficiency, is the road to serfdom, or to human misery, from which arise strikes and other industrial disturbances.

Here it must be repeated that discontent may arise for reasons that are not clear to the worker: he may complain about one thing when in fact the unconscious basis of his happiness is something totally different. He may assert that his wages are too low when he is really, although unconsciously frustrated in his desire for human responsibility in his job.

True enough, there may be some substance in his conscious complaint, but, if there is an unconscious factor at work, the raising of his wages will not, by itself, produce permanent satisfaction. Of course, I am not denying that there are human cogs, whose make-up is such that they cannot be more than cogs, and who are completely happy in their place. Trouble arises when the more highly endowed human being is forced into cogishness.

[To be concluded]

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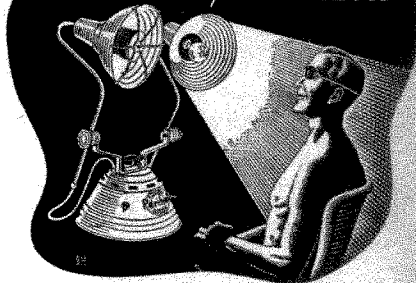
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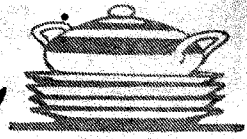
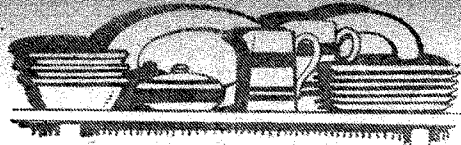
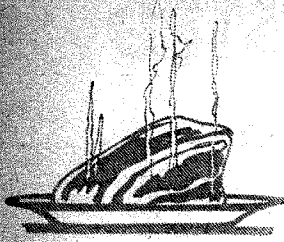
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Canteen

The Challenge Answered

• We Say ! —

“Industry Can Run Its Own Canteen”

By S. A. BROOKS-WARD and V. G. HILTON

WE do agree that canteens must be run economically, and that all waste be carefully avoided. We also agree that the manager of a canteen, or of any other catering establishment wherever situated, must be efficient.

We fail to see, however, how the catering contractor is in a position to run a canteen more successfully than an efficient manager or manageress directly employed by any industrial undertaking.

The whole case for direct management is based upon the understanding that the management is efficient, and such personnel are readily obtainable to-day.

Catering in industry is primarily a welfare activity, and no welfare activity should be commercialised. Therefore, in directly operated canteens, given efficiency equal to that of the best catering contractor, the customer must of necessity benefit in price, quality, quantity and type of meals served, by the saving of extraneous commercial charges which do otherwise occur.

It is conceded on all sides that direct control of large canteens is desirable. As industrial undertakings are themselves of necessity run efficiently, they will automatically ensure that the management of the canteen is equally efficient, in consequence of which the manager or manageress will have to be alive to any new developments which will maintain the progress of the canteen.

Again, the customer must benefit by the maintenance of a high standard of catering, as any carelessness in this direction is bound to reflect upon the person responsible. Any alternative form of control is, therefore, bound to prove less satisfactory.

With reference to the suggestion that the small canteens doing about 150 luncheons per day, with a correspondingly small turnover, will

type of manageress, we see no reason why the same principles of efficiency should not be applied to the smaller canteens as are applicable to the larger ones, having regard to the equal interest which industrialists pay to the welfare of such employees.

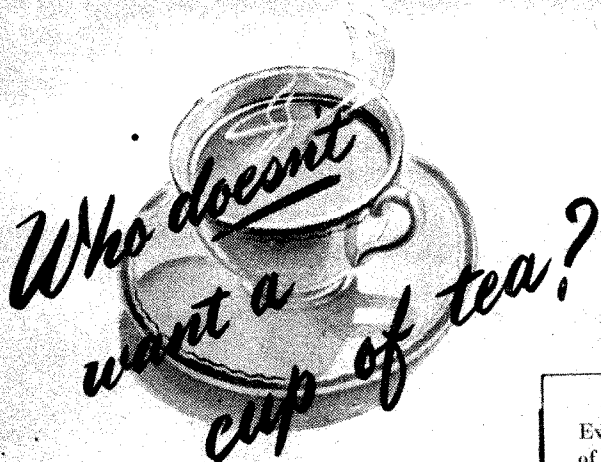
On the question of selecting Canteen Committees from the users of the canteen to co-operate with the Canteen Management; this system, in our view, can be of considerable help, providing the committees are wisely chosen, and are co-operative and helpful in their approach to canteen problems and management, and the management of the undertaking has a direct interest in the canteen.

These advantages, in our opinion, would scarcely be obtainable where the responsibility of the catering rests in outside hands, to whom complaints would have to be submitted, making them more difficult to remedy than where the responsibility is internal.

It is generally understood that, in the case of Contractors, the costs of operating the canteen are limited to certain specific and fundamental items of expenditure, whereas in the case of directly managed canteens it must be generally admitted they are often called upon to meet a considerably higher percentage of the general running expenses, in consequence of which greater efficiency is called for.

Finally, with reference to the summary “Is it advisable for an Engineering Factory to do its own laundry”, one supposes it can be said that there are many instances of laundries running their own canteens, but in an engineering factory there are many operations such as transport, etc., which are efficiently run under the control of their appointed executives.

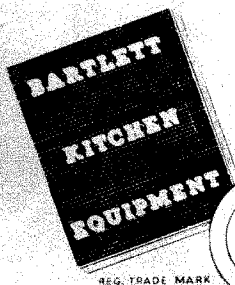
If a firm can find someone sufficiently capable of running any department inside their organisation, we see nothing to detract from the



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By J. L. SHARP

Chairman, Canteen Committee, Acton Bolt Ltd.

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Each year, a Committee is elected by the workers for the organisation of the Works

Sports Club, and from the Committee are elected four members of the Canteen Committee, the Manageress of the canteen being co-opted. This small Committee meets each week to discuss the financial position of the preceding week and to deal with any complaints which have been made by workers to members of the Committee, also to recommend any improvements which can be made.

Below is an example of a week's account:

	£	s.	d.
Opening stock	154	10	0
Purchases cash	109	19	11
Purchases and expenses credit ...	14	1	3
Cash expenses	5	18	1½
Wages	43	18	1
Profit for week	12	8	1½

Total £340 15 6½

	£	s.	d.
Takings	183	2	2
Closing stock	157	13	4

£340 15 6

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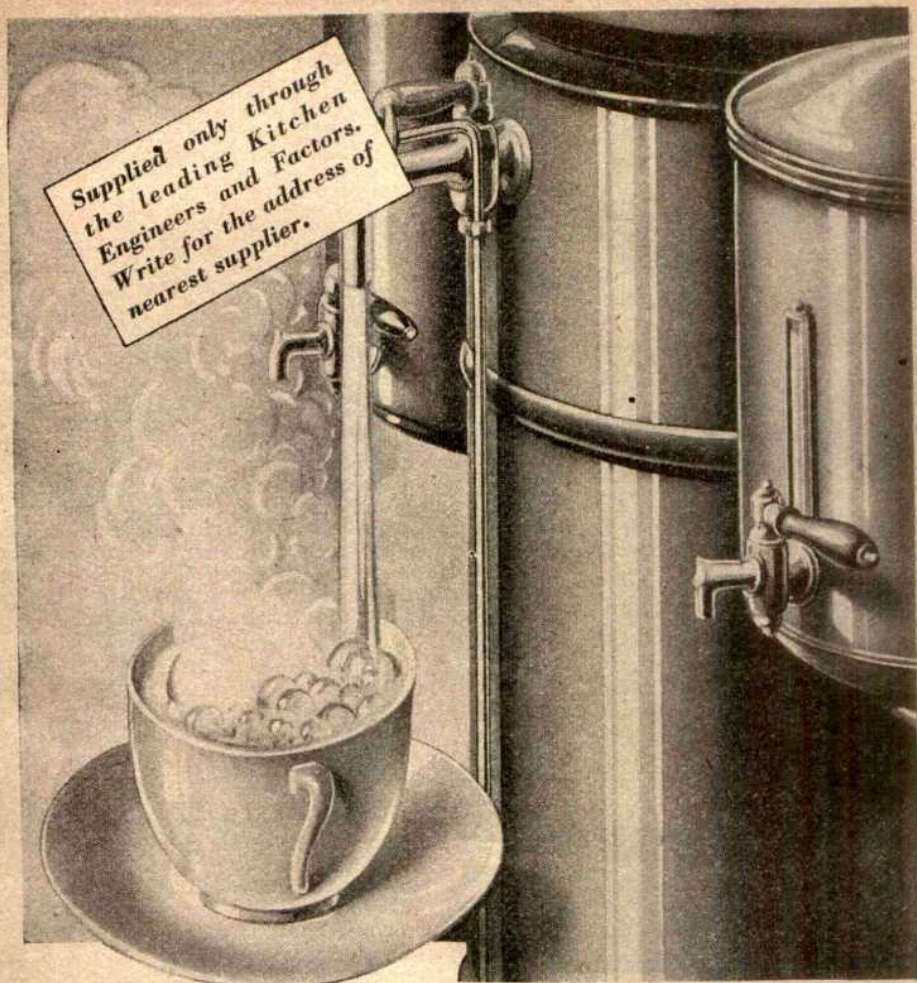
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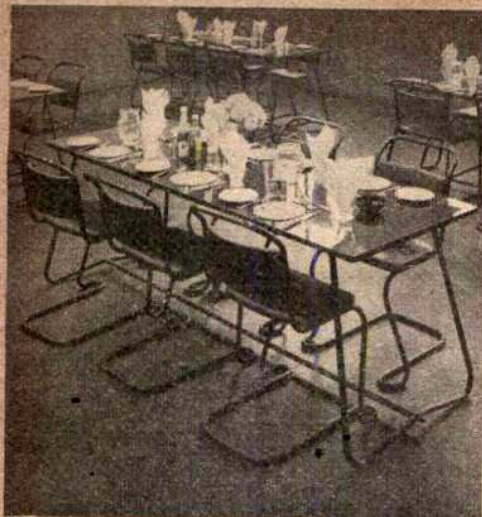
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The stock is taken each week by members of the Committee and valued at purchase price—by this means any discrepancies can be quickly found.

By giving careful consideration to all suggestions and complaints, we have found that the number of meals served has increased as shown in the following tables:

Week Ending November 15, 1944.

Number employed	...	...	...	780
Main meals	...	...	...	1,880
Breakfasts	...	...	...	21
Sub-meals	...	...	...	2,364
Tea meals	...	...	...	3,520

Week Ending September 15, 1945.

Number employed	...	...	...	570
Main meals	...	...	...	2,100
Breakfasts	...	...	...	82
Sub-meals	...	...	...	2,319
Tea meals	...	...	...	2,653

The management has made arrangements for the sale of cakes to the workers in the morning and afternoon breaks, and orders are collected and prepared for each section of the factory, so that no time is lost in waiting for service.

Cigarettes and tobacco are sold at lunch times, this being not only a source of profit, but a service which has been greatly appreciated during the period of shortage.

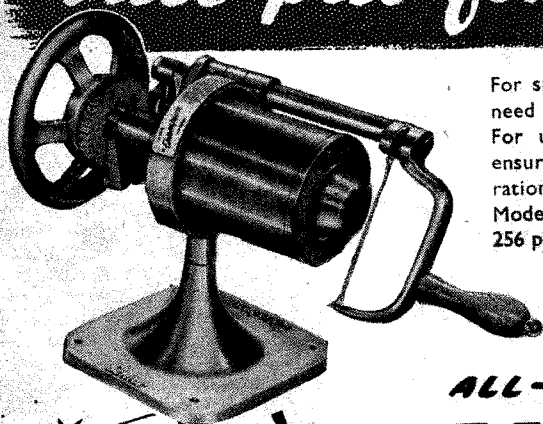
The standard prices are 2d. for soup, 9d. for the main meal, 3d. for the sweet and 1d. per cup for tea or coffee. Typical menus are given below:

- (1) Soup.
Roast Lamb.
Three vegetables.
Suet roll and jam sauce.
Macaroni pudding.
Lemonade, tea or coffee.
- (2) Soup.
Fish and chips.
Sultana roll and custard.
Macaroni.
Lemonade, tea or coffee.
- (3) Soup.
Cottage pie.
Three vegetables.
Lemon curd tart and custard.
Milk pudding.
Lemonade, tea or coffee.
- (4) Soup.
Cold meat and salad.
Chips.
Apple pudding and custard.
Milk pudding.
Lemonade, tea or coffee.
- (5) Soup.
Roast lamb and baked potatoes.
Two vegetables.
Date slice and custard.
Milk pudding.
Lemonade, tea or coffee.

Waste is avoided by serving a small portion of each vegetable and allowing customers to help themselves from large dishes if they require more.

The real secret in running a works canteen for profit and to satisfy the workers, lies (in my opinion) with the Manageress, who has to do all the buying and supervise the cooking.

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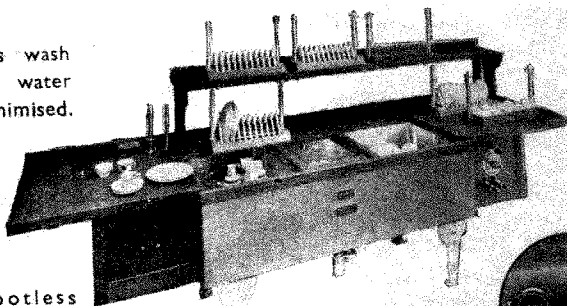
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and service—and it is in the cooking that the greatest economies can be effected.

The workers have an arrangement with the management whereby the workers pay for electricity and gas, whilst the management supply the premises free of charge as long as the catering is to the satisfaction of the workers. The workers supply the tea for the morning and afternoon breaks at cost price.

At social functions such as dances, concerts, etc., the prices are increased, and a balance sheet is submitted for each, the takings from the licensed bar being kept entirely separate.

Lunch is served from hot plates to 350 workers within seven minutes; tickets are issued at the cash desk, and the meals are exchanged for tickets over the counter. Eighty meals per day are served in the staff canteen, where an extra rd. is charged for service, but the meal is identical with that served in the works canteen.

We have found that it is neither possible nor profitable, and also a source of complaints, to give an alternative meal. In the case of regular customers who are on diet, their needs are made known to the Manageress and special food is prepared for them.

With acknowledgements to "WELFARE"

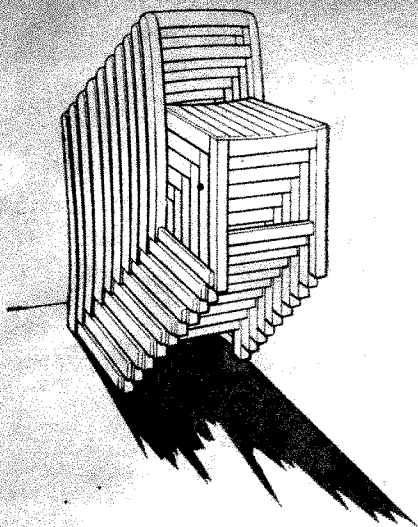
DUNLOP'S 6 POINTS

Continued from page 44

and the new educational plans are designed to speed the progress up the ladder of the new executives who will be needed to carry out the Company's plans.

The problems which many industrialists are meeting at the moment, and which many more will meet as post-war competition gets into its stride, are not new for Dunlop. Over the past 50 years it has had to face almost every difficulty that can be imagined. Shortages of raw materials, wild fluctuations in prices, unfair competition from Japan and other low-wage countries—all these have been met and surmounted. Many of these were as political and as difficult as any questions now emerging. With the backing of the directors of Dunlop, Sir Charles is confident that one of the most valuable ways of meeting these new problems will be by education and that the time to get it started is now. He believes that the trying out of a new and complex economic theory is a long-term affair, and that meantime Britain, as a great exporting nation, must co-operate and produce if it is to go on eating.

Some employers are deterred from undertaking education schemes by the admitted difficulty in selection of promising material. Dunlop is meeting this in two ways. First, the training plans are designed to make the individual more valuable to himself, to the Company, and to the country. Secondly, there is an intense and constant watch for those, both juvenile and adult, who appear to merit special treatment. There is an old saying at Dunlop that "The one way to keep a good man down is never to find him." Finding him is therefore one of the major responsibilities of every supervisory and executive member of the whole organisation.

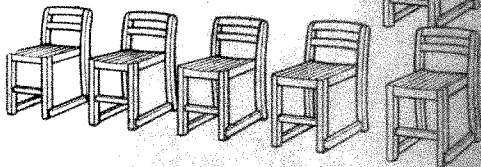


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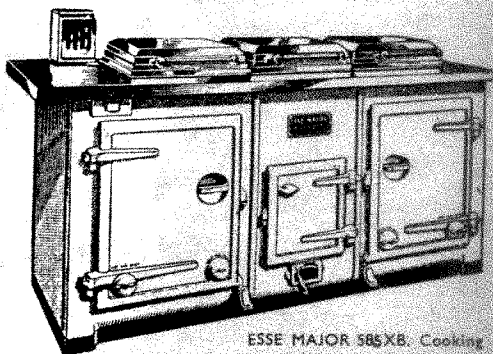
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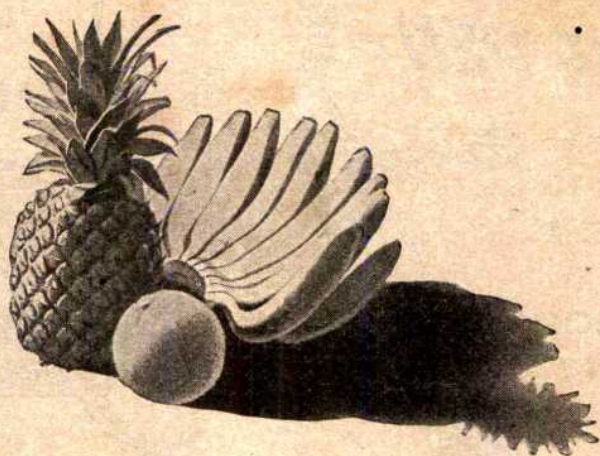
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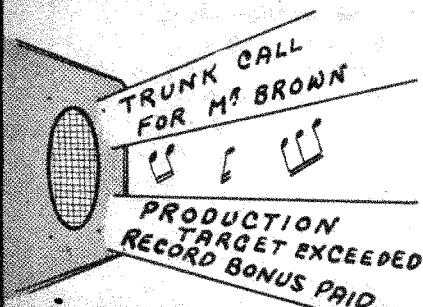
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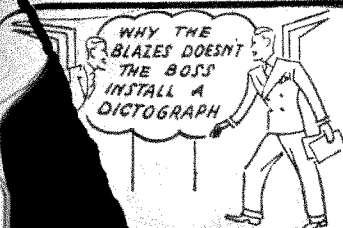


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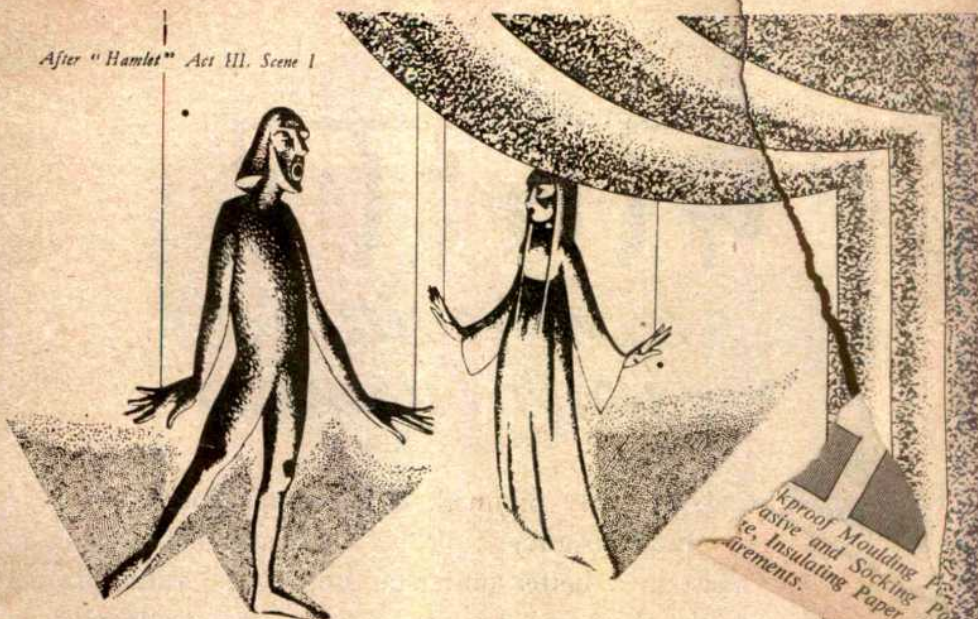
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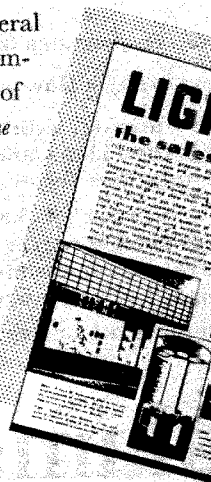
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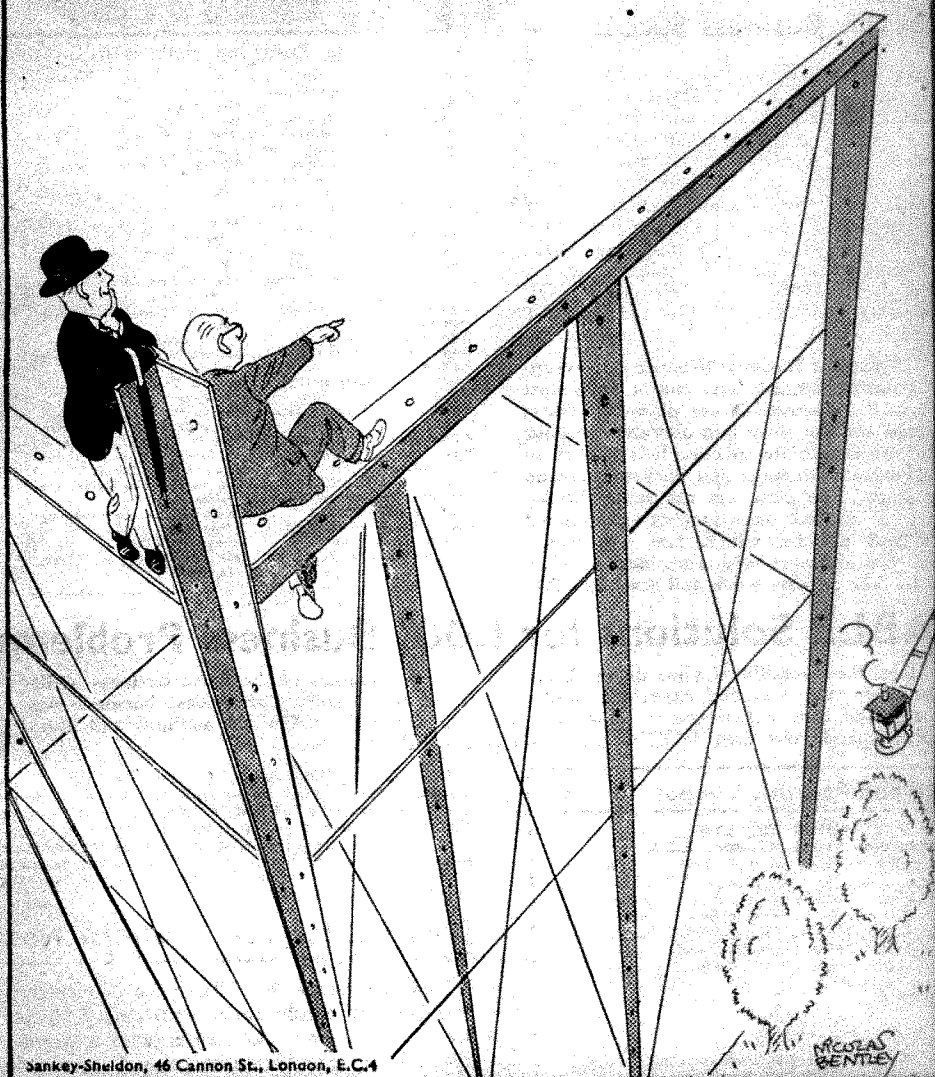
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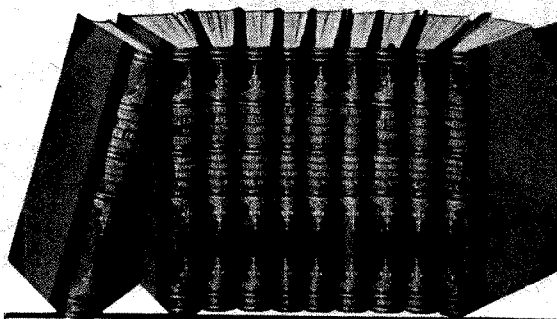


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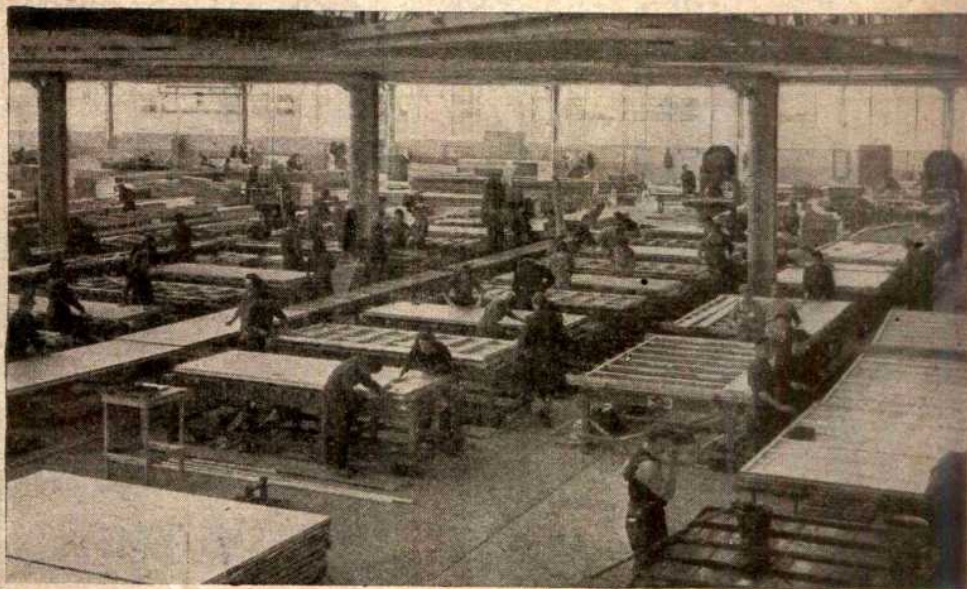
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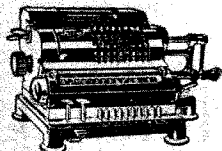


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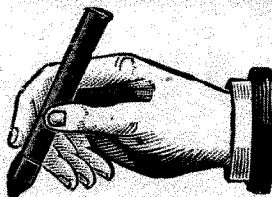
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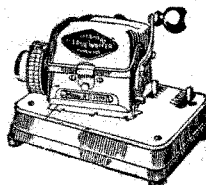
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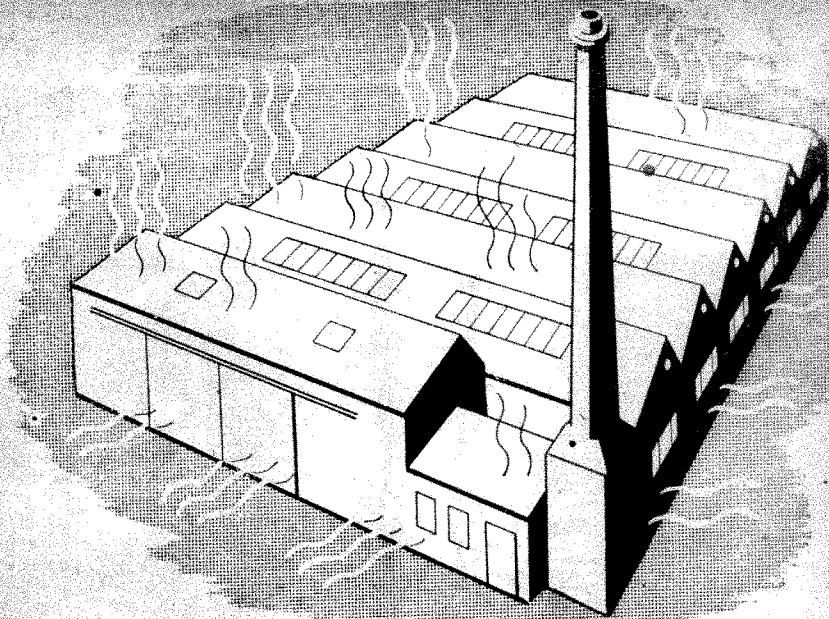
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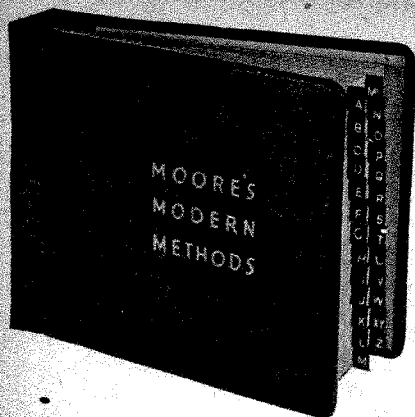
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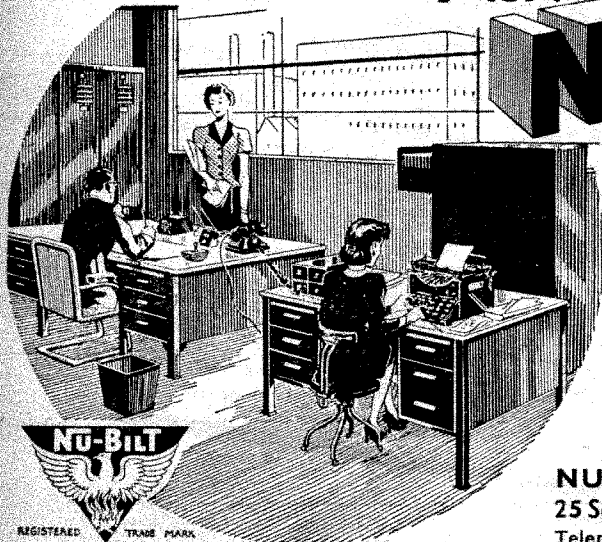
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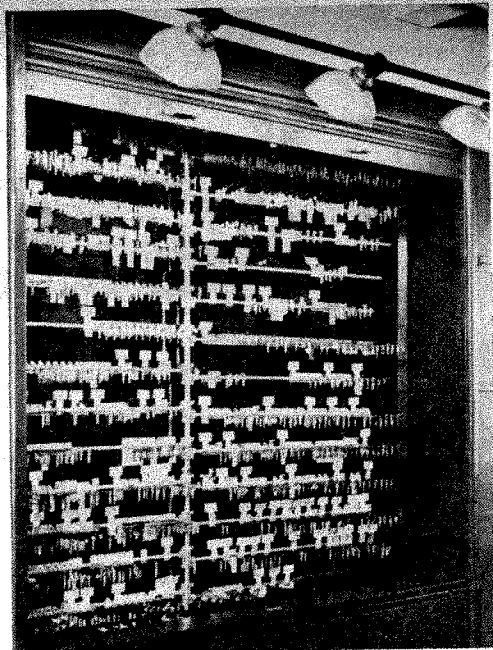
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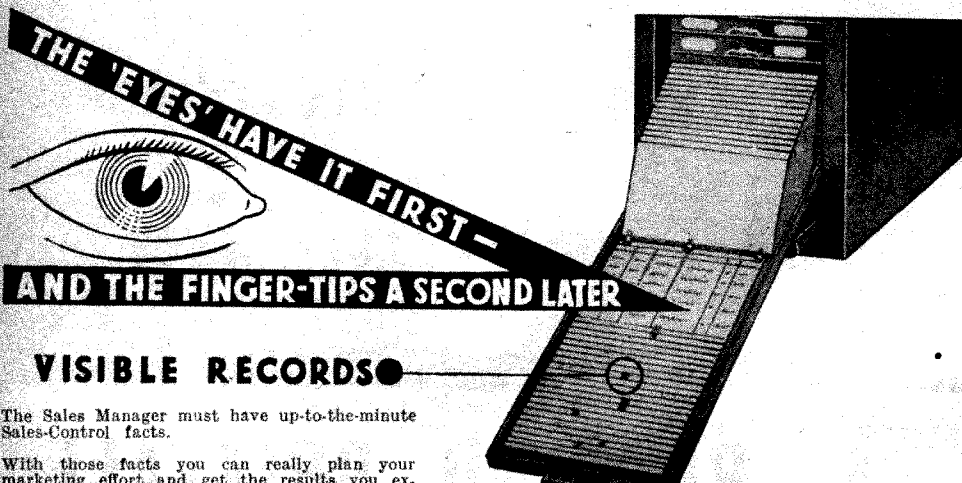
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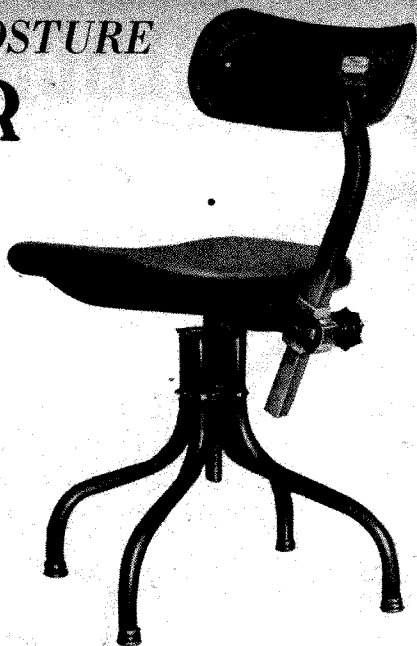
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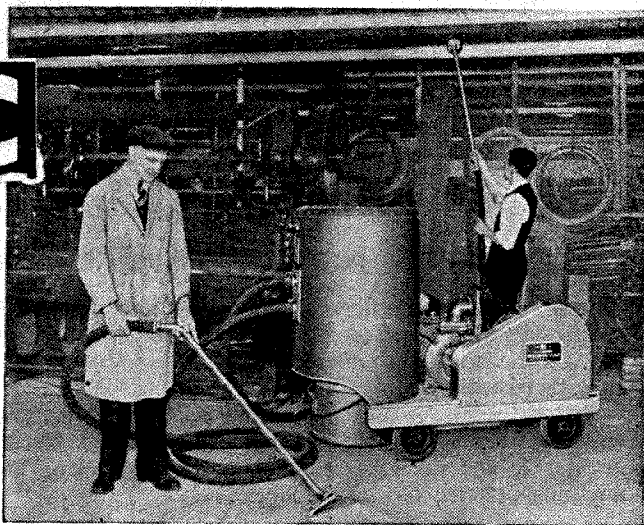
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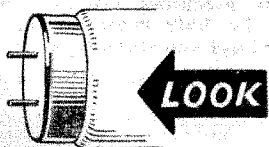
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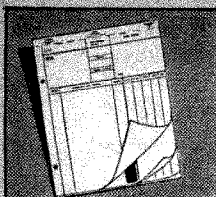
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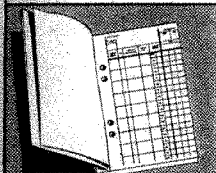
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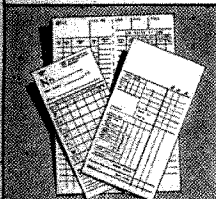
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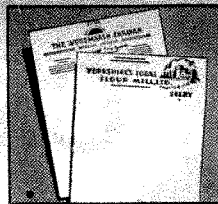
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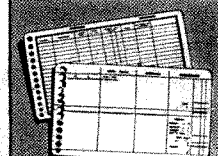
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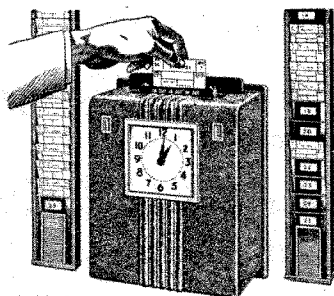
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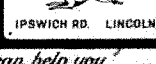
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BUSINESS

FEBRUARY

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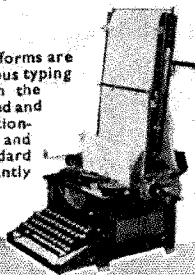
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I.T.R. Co. Ltd.	105
Nu-Bilt Typewriters	16
Taylor's Typewriter Co.	12

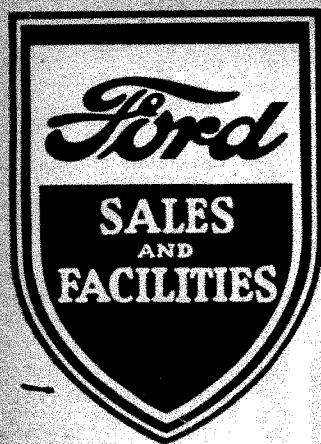
VISIBLE RECORDS

Art Metal Co.	71
Cave, C. W. & Co.	103
Colourdex Control Ltd.	20
Copeland-Chatterton	19
Jones, Percy (Twinlock)	14
Kalamazoo Ltd.	7
Kardex	86
Moore's Modern	
Methods Ltd.	16
Seldex Ltd.	22
Shannon Ltd.	78



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Made in Great Britain



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in practically every town in the
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— it is simple to understand why
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BUSINESS

MANAGEMENT PRODUCTION PERSONNEL

After 20 years of trial and error, this new but fundamental administration technique is gradually coming into action in a few of the most progressively managed concerns



The basic principles and one of the most significant steps in practice in this new conception of management are examined by
BRIAN CUMMINGS
who interviews its leading British authority

DYNAMIC ADMINISTRATION

Lieut. Col. L. URWICK

IT is the second month in what will be the most critical year for Britain since 1940. The ship of State, which has just weathered the worst storm of its career, faces a voyage fraught with hardship and danger before it can reach the port of prosperity. The people on board are working their passages, but they are tired and much burdened. They need sound leadership, yet of the crew itself only a few know their jobs. The rest are learning the ropes.

As so often happens, it falls to the men who are out of sight and sound in the hold of the ship to supply the necessary guidance. The men who control business, trade and industry—the very motive power of the vessel—are practically the only ones with experience adequate to the task. Do they recognise their responsi-

bilities? We think so. Does top management appreciate how great is the need for imagination and deep thinking in approaching its task? Of that we are not quite so sure.

In the last issue of *BUSINESS*, industry was examined on the issue of Production Per Man Hour. And largely industry was found wanting. If management is to justify its oft-expressed claim to be able—given the chance—to show the world what well administered private enterprise can do, this heart-searching and confession must continue, however painful the process.

To-day we turn to Dynamic Administration, a subject which is a focal point of conversation and hard thinking among the livelier concerns. But to the majority, utterance of the words leads only to confusion and even, in some

cases, to alarm. "What is this dynamic administration?" they ask. "We have never heard of it." Very well, let us proceed to a definition.

Dynamic administration is a term covering a whole philosophy of life founded by Mary Parker Follett, American political scientist and philosopher, whose main field of interest was the psychological foundations of all human activity, and the emotional reactions that come into play in the working of human groups. Her conclusions are likely, in the course of time, to influence all organised human activity. Their most immediate effect will be felt in business and industrial administration. In fact, their effect is even now beginning to be felt in this country.

— The Follett Philosophy

Mary Follett's philosophy amounts to this: any enduring society, any continuously productive industrial organisation, must be founded upon a recognition of the motivating desires of the individual, and of the group. The object of the democratic way of life, implemented by intelligent organisation and administration of Government and of industry, is to work towards an honest integration of all points of view, to the end that every individuality may be mobilised and made to count, both as a person and as an effective part of his group, and of society as a whole.

The key-word here is integration. But what precisely does it mean? For an explanation, we can turn to the best-known British authority on the work of Mary Parker Follett—Lieut.-Col. L. Urwick. He is a management consultant, joint editor of her collected papers, and, with Mr. E. F. L. Brech, author of "The Making of Scientific Management." Vol. I. of this

book, "Thirteen Pioneers," includes a short sketch of Mary Follett's life and work.

Col Urwick* draws the contrast between integration and compromise. He says:

"The compromising of different points of view, which is of the essence of political process, is totally at odds with the scientific approach to questions of industrial management. You cannot hold a scientific principle to be accurate, and then surrender a part of it in order to do a deal. If it has any validity as a principle at all, it is integral, one whole."

Col. Urwick gives this example of what he means by integration.

"Twenty glove cutters occupied a shop on the first floor of a factory. Six of them were old men who liked to have a fire in the shop, shut all the windows, and create a glorious fug. The other fourteen were all younger men, a number of them just back from the last war, where they had become accustomed to open air. They loathed 'thick' atmosphere.

"But the older men claimed that their seniority entitled them to work in warm air if they wanted to. They were not used to a lower temperature and draughts. If they had to work in these conditions, they argued, they would be ill, which was probably true. The young men could put up with the warm room: they would get used to it.

"There was a constant struggle in the shop between the young men and the seniors. The young men would fling open a window in the luncheon hour. The old men would come back and shiver and swear. They tried to compromise by regulating the temperature of the room somewhere halfway between the level claimed by either party. But that satisfied neither. It was still too warm for the younger men, and too cold for the old boys. Feeling

THE ROOT OF IT ALL

A new form of business philosophy. Its roots lie in a belief that successful administration depends on the integration of all points of view in disputes and problems. Integration can be achieved by :

- Bringing differences into the open.
- Breaking down the demands of the two sides into their different parts.
- Watching and anticipating response.
- Infusing into the firm a common purpose in terms of benefit to all, irrespective of group or class.



L. URWICK, O.B.E., M.C.,
M.A., F.I.L.A.

began to rim high. There were constant rows. They appealed to the management. The management, wisely as it turned out, said that it was a matter which the men must settle for themselves.

"On the whole, the young men could not insist on their point of view though they were in the majority, and the management's refusal to intervene made them go back and look at the problem again. Then one of them came to the management and said, 'There is a small room on the ground floor which is only used for storage. It will easily hold six cutters. If you moved the six old men out of our room, and put some racks up in the space thus vacated, it will hold all the material in the little room downstairs. Why not put the cutting benches for the older men in this little room? There is a fireplace in it, and they can flog away to their heart's content. We younger men in the upper room shall be able to have exactly the temperature we need. Moreover, putting them on the ground floor will save the old men having to go up and down stairs to collect their material, which is a burden to them but no trouble for the younger men.'

"This was a real integration—an alternative which nobody had thought of before, but which completely satisfied all that both parties wanted."

Making Friction Work

For the purpose of securing integration, Col. Urwick emphasises four principles derived from Mary Follett's philosophy. They constitute the way to make friction work positively in industry. They are:

1. Bring differences into the open, as opposed to evading or suppressing the issue, either from diffidence or as a bargaining counter.

2. Break down the demands of the two sides into their different parts. This involves an examination of the words used. Do they express what the parties really want, or do they in fact stand for some other unexpressed demand? Alternatively, you may have to do the opposite; to discover the whole, the real demand, that is being obscured by one or more minor claims.

3. Watch response, anticipate response. Response is always circular. What B. says, or does, is never a simple reply to what A. has said, or done. It is a reply conditioned by A.'s work or action, and so on, *ad infinitum*.

4. Define the objective. You cannot reconcile specialists to each other and preserve the freedom which keeps scientific invention alive, except in the light of a common purpose which is alive and real in the minds of them all. Such a purpose is inconceivable, except in terms of benefit to all the people, not to any particular group or class.

Business is a part of life. It must have a moral foundation, or it is inconsistent with any view of life which an honest man can state decently in public. The conclusion is obvious. We need to restate our philosophy of economic life in terms which can give our collaborators, whether specialists or workers, that sense of purpose.

Putting Them Into Effect

He stated these four working principles a year ago. The questions immediately arise. Are they affecting business practice to-day? How should they be put into effect? It was to gain further information on these points that I saw Col. Urwick. This is what he said:—

"Many more people are thinking about administration dynamically to-day than there were ten years ago. But each new person who starts thinking about it, has to go through a mental evolution. You cannot expect real progress in the theory of business administration in shorter periods than decades. About ten years is the shortest period over which you ought to take stock. One of our difficulties is that that kind of long term thinking does not suit politicians. When I was with Rowntree, he said started reorganising the management of that extremely well-run family business in 1920. I went to him in 1921, and left in 1928. I don't think he began to realise the full results of that work until about 1935. And Rowntree had superlative skill in the art of taking people along with him.

"You have got to distinguish between two things—a readiness to try to apply new methods in the same spirit as that of a man who, when he happens to hear of a new type of machine, is willing to buy one as an experiment, and the change of outlook and attitude which makes it inevitable that he will hear about any new machine, which keeps him looking for new machines all the time. In the latter case, and applying this analogy to management, he has realised that continuous re-organisation is an essential obligation of leadership. The leaders of the best managed businesses are never contented. In fact, if you find a business that is pleased with itself, it is an almost certain sign that its management is not up to the mark.

"Our own experience, as consultants, is that the average business in this country is much more inclined than it was ten years ago to come to us and say: 'We have a problem. Perhaps you can help us solve it.' In the past we had to go to them and say: 'We have a system which will save you £10,000. Would you like to hear about it?' But possibly the businesses which

* In an address to the Merseyside branch of the Institute of Labour Management and the Merseyside Centre of the Institute of Industrial Administration, printed in "Industry Illustrated."

come to us are selected rather than average, in that they come to us at all."

We went on to talk about the steps which firms should take towards putting into practice the attitude of mind which is implied in the words, "Dynamic Administration." I asked if firms should give new employees a special induction period in which to acquire the "feel" and purpose of the concern. Should there be a special training scheme for those likely to be promoted to positions of authority? Col. Urwick replied:

"I think it is absolutely essential that there should be what the Americans call a 'vestibule school,' i.e. a means of integrating employees of all grades with the organisation, of easing off that 'new boy' feeling. That cuts both ways, too. It gets the 'new boys' colleagues used to them as well. The training problem is always a double one. You have to train a man for his work, and adjust him to the organisation. That applies especially to young people, who are nervous, and snap because they are shy, just like puppies sometimes snap from sheer nerves. You hear complaints that workers are treated like machines. If only they were! Supervisors and managers know that they can only deal with machines by understanding how they work. But instead of trying to understand how people work, too often they fall back on cajoling or punishing them.

Give Time to Training

"As to your second question, I am inclined to discourage smaller businesses from running their own training schemes. They have not enough width of experience, or width of example to back a satisfactory training scheme for supervisors. But effort and time, particularly time, should be directed towards training all persons who are going to occupy positions of authority of any kind.

"Particularly where a man or woman is promoted for the first time from being a rank and file worker, I believe it would very often pay firms to say 'Look here, for the next twelve months I shall not expect you to devote a 100 per cent of your time to your daily work, give it 80

per cent, and 20 per cent of your time to training yourself. For example, have you seen any other offices or factories? No? Then every week-end for the next ten or twelve weeks, I want you to go away and see other offices and factories. I will give you the introductions. Do not go there just to gaze. Go there to think. I shall want a little report from you on what you have seen at each factory.'

"Men newly appointed to authority should also be encouraged to read books on management, starting with the simple ones.

"When people talk about training they always envisage some kind of school, with classes and lectures. I think the best training can be done much more simply than that, by the supervisors or managers, if they are interested in the men who work for them. The trouble is, they always make the mistake of asking the trainee to do the necessary reading and theoretical work in his spare time. Time after time I have promoted men of 30, or thereabouts, and given them this chance of training themselves in the company's time. They simply jump at it, if they are fit for promotion at all. If you put it to them the way I have described, they realise you are trying to help them to improve their own value, their standard of managerial skill, by their own efforts. You are bringing something out of them, which is the real meaning of education, not merely pumping so much knowledge into them. It means you lose 20 per cent of the man's output for one or two years; but at the end of that period his output as a manager is doubled."

We went on to discuss the impact on top management of the dynamic administration outlook.

"You cannot expect people to grow mentally unless you give them time to think. So many people mistake busy-ness for business," said Col. Urwick in answer to a point I had raised. "If you come to me next week and I cannot spare five minutes to see you, that will be my fault, and it will be bad business."

Then he dealt with the position of specialist observers in top management. "In any large scale business," he said, "there is undoubtedly room for a man trained as an economist, who



No manager of any considerable factory should be without a Works Council. But a Works Council cannot in any circumstances run a business. It must remain what it is intended to be—a channel of communication



THE NEED IS FOR

- Recognition of management as a science.
- 'Vestibule' schools to induct new employees.
- Supervised training for everyone taking authority.
- Works Councils as a channel for information.
- Distinction between the management of parent and subsidiary companies.
- Continuous reorganisation.

has no other duties except to keep a constant watch on economic tendencies, and to translate their implications into terms of that particular business. Firms go wrong when they get economists who are first-class academically, but forget to train them to think in terms of their particular business. Their advice is useless because it is not related to a specific situation.

"At Rowntree's they did the thing properly. They appointed an economic advisor to the directors more than twenty years ago. He saved them his salary for each year he was employed, scores of times over, because he forced them to think of the overall economic situation in relation to such practical questions as when to buy raw materials, what level of stocks to carry, and so on."

Separate Egos from Opinions

I asked two more questions. In what way can friction be made to work, to produce "plus-values," as Mary Follett suggested? Should larger firms be broken up into small units, where practicable? Col. Urwick said:

"The kind of set-up that makes friction work constructively is the kind of set-up that does not regard a difference of opinion as an 'incident,' which encourages and teaches everybody all the time not to identify their egos with their opinions.

"Take selecting men for appointments. I see four or five people every week, possible candidates for appointments. I see a man and I like him, and weighing up his qualifications I think he is a very suitable man for this organisation, of which I am chief executive. But I never appoint him on my own unsupported judgment.

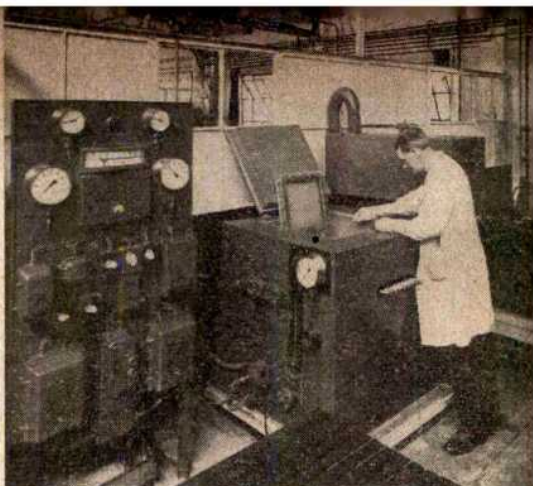
"I take him up in front of our selection committee, which includes four or five of my most experienced colleagues. Often I find that two members of that committee do not like him at

employment by the Company. For me to get at all upset or bothered because their views do not agree with mine is to identify my opinion with my ego, to treat the difference of opinion as a personal criticism. That is complete nonsense. They don't think that a particular man is suitable. That is a fact about the man. Which of us is right is of secondary importance. The important thing is to register the fact. This man has not appealed to two very important and experienced executives. Therefore he is not likely to make a good consultant. That, in a sense, is making friction work.

"Wherever you get difference of opinion, the assumption should be that there is something in both views, and you have got to find an answer that eliminates the objection in both cases. You can only do that if people understand that they have no right to get angry if other people's opinions differ from their own. They have got to understand that people, even quite subordinate people, are entitled to their own opinions."

In view of these opinions it is not surprising that Col. Urwick takes a poor view of so-called "grievance" committees. He objects to the attitude of mind betrayed by the title in the minds of the people who set them up. "But what should take their place?" I asked. "Should there be some form of 'ideas' committee instead?"

"No manager of any considerable factory should be without a Works Council," said Col. Urwick. "But a Works Council cannot in any circumstances run a business. It must remain what it is intended to be—a channel of communication. Take the Russian experience. A lot of them cherished the delusion, which a great many people in this country also hold, that you can actually manage a business through its Works Council. The Russians tried it, and it was completely disastrous. They gave up the attempt entirely in three or four years."



Although their efforts are individual in many cases, the complex finished unit is the result of team work. Getting together to do a sound job is most essential

P-MAN-H-2.

Getting Together To Step Up P.M.H.

By D. F. HUTCHISON

Labour Manager, Philips Mitcham Factories

WHEN an authority on the subject, like Lewis C. Ord, makes comparisons between British and American efficiency, it behoves the watchful to stop, look and listen. And he estimates that the responsibility for our lower output per man, which could be charged as a fault to the workers within British industry, is less than 20 per cent of the total deficiency.

In other words, of those symbols P.M.H., the emphasis is on *man*, but only to the extent of 20 per cent.

Too often workers are blamed when indeed the causes for output deficiency might be discovered elsewhere. At the same time, he argued, there can be no doubt at all that suspicion, fear and doubt did, in the past, jeopardise the relationship between management and worker.

The fallacy that there is within the national economy, a certain fixed and limited amount of work, has never been nationally exploded. For that matter, there are few managements who have attempted to knock the bottom from this fallacy, and yet it has been one of the greatest enemies to full production.

The average worker is scared to work too hard, for he feels that if he does too much, he lessens the prospect of his continued employment. He believes that if his workmates and associates go all out for production, they jeopardise their own security. The whole

week was too long, but that work would go further if, by restrictive practice, the time taken to do it was spread out over a longer period.

If such a belief is allowed to persist, it is obvious that all of managements' attempts to step up production by policies of scrapping old plant and replacing with new, or by embracing the newest techniques and using the new materials, will go for nought because the man who will use the new machine and use the new materials would still fail to see a reason for putting every ounce of effort behind the production wheel.

The message that must be got across, not only at the factory floor level, but at the national level also, is that our drive for production demands the resuscitation and the maintenance of the spirit which made our gigantic wartime achievements possible. Perhaps it is true that propaganda stressing the necessity for a sustained production drive to ensure our economic survival in peace time is getting across. But, if that is so, in every factory the issue must be narrowed, made more pointed and more specific.

Managements must take a hand in the economic education of their operatives, and show that work begets work; that production is a snowball; that as it grows up, so do their wages and purchasing power; that the whole tempo of demand, as it increases, creates a new



OURS TO BUILD
OUT OF THE CHAOS
OF WAR A NEW
WORLD IS BEING
SHAPE. EACH OF
US HAS A PART
TO PLAY

It's up to us!



**WHERE ARE THE
TOOLS?**

RIGHT HERE IN THE
FACTORY AND IN YOUR
HOMES TOO ARE THE
TOOLS TO SHAPE OUR
WORLD

It's up to us!



No splash and have done with it methods
when these posters were exhibited
With psychological appreciation of
curiosity they appeared one by one

and the only people who can do these things are the people of industry, management and men.

It is vital that management gets down to these truths. They must show that the purpose of increased efficiency of industry is to enable it to provide more new wealth for the workers, and for the nation. It must be shown, at the same time, that as its efficiency increases, the regard can be made to increase proportionately. It is too often overlooked that the efficiency of industry is the average amount of real wealth produced per person in industry.

We here at Philips are convinced of this. So much so that whilst admitting that J.P.C.s during the war, contributed to this spirit, we consider that the technique can be broadened with advantage to management, to worker and consequently to output.

Joint consultation has had a chequered career. Sometimes it has failed and sometimes there has been every indication that it partially succeeded in dispelling class suspicions and overcoming the obstacles to mutual confidence.

Teamwork Dispels Suspicion

During the war our management and workers were brought closer together. They discovered each other. The workers found that many of the fears and much of their distrust were unfounded, but not all suspicion has been dissipated. Some of it still exists, and it will continue to exist until our industrial problems and relations are approached without reserve.

Before real progress can be made, three fundamental needs must be acknowledged:

1. Unrestricted flow of information in both directions.
2. Full representation of employees in joint consultation with the management.
3. Personal responsibility for the effort to be made in the national interest.

The J.P.C.s during the war, concerned themselves solely with war production. With our new Advisory Council plan, we take the technique several stages further. But first of all we had to get our new Joint Consultation in Industry plan across to the workers. We had to prove that pulling their weight was a public spirited business and that selfishness was not the prime aim in production.

stewards and the management together. Management produced a series of four posters, together with a booklet. The shop stewards addressed the following letter to every worker: "Dear Fellow Worker,

Very shortly you will be hearing quite a lot about a new machinery to be set up within the factory for joint consultation between the management and the employees.

For a very considerable time now discussions have been taking place between the management and your representatives, who have now reached mutual agreement as to the form of the proposals we are about to present to you.

During the past six years much has been said about the 'team work' which has enabled us to produce the tools and implements of war that led our fighting forces to victory. It is our desire to see that the experience gained during those never to be forgotten years shall be used to the fullest advantage to bring about better jobs, good homes, more leisure, safer and better working conditions, and social security for all.

This, we believe, can only be achieved by a determined effort on the parts of both management and workers alike.

During the recent General Election we were instrumental in electing the Government of our choice, and it is our duty to our Country to assist them in every possible way to implement a programme which we, as Trade Unionists, believe to be the solution in overcoming those dark years which led us to unemployment, bad living and working conditions, and the two bloodiest wars in world history.

We believe we can play our small part in this gigantic task of reconstruction that lies ahead of us *inside this factory*, and it is for this reason we appeal to you for your energetic support in making this joint effort a real success, and we look forward with you to a time, not far distant, when a better understanding between employers and workers has been reached.

Determination on the part of us all will bring success.

Yours fraternally,
THE SHOP STEWARDS' COMMITTEES.
Amalgamated Engineering Union.
Electrical Trades Union.

We decided that the J.P.C., limited in its function and in its personnel, must be extended and broadened. Our new plan for joint consultation differs from others, past and present, in that every hourly paid employee over the age of 18 is represented, and can take an active part in it. Full representation is assured by the setting up of departmental committees from whose members, a central committee, which we call the Joint Advisory Council, will be formed.

We do not, as in the case of the J.P.C., confine the agenda of the new council to matters of production only. The aim is to improve relations within the factory, to increase productive efficiency and output by co-operation, to diagnose departmental feelings, to reconcile any differences that might arise, and in every way to further the interests of the employee, the consumer, and the company.

T.U. Support—Free Choice

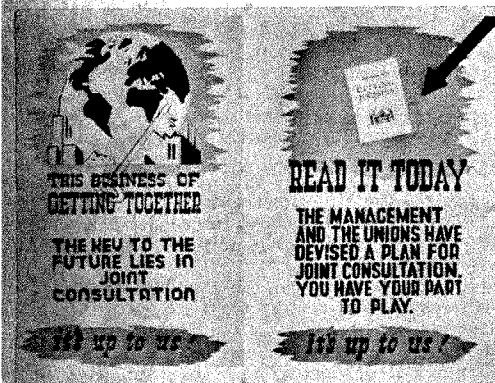
Employees are left to themselves to decide as to whether or not they become members of a Trade Union. The Trade Union limitation was, of course, a limiting factor in the case of the J.P.C., only active Trade Unionists being allowed under their constitution, to participate in the J.P.C. But the management consider that in all negotiations inside the factory, employees should as far as possible, be represented

This business of

GETTING TOGETHER



When the last poster appeared interest was intense. The booklet eagerly awaited was speedily distributed



by the man or women they have themselves elected. Acceptance of these principles, obviously demanded a different constitution from the J.P.C., and it was necessary to find an arrangement that would be acceptable to Unions, employees and management. All have their rights, and while concessions in the common interest have had to be made, the new plan for joint consultation preserves these rights.

The shop stewards will continue to be elected in accordance with Trade Union rules, but employees will decide which of them will serve on the departmental committees which are the basis of the new Joint Advisory Council. The shop stewards who do not serve on the departmental committees continue to carry out their other duties as laid down by the Trade Unions.

The factory is divided into constituencies, or areas, each of which consists of one or more of the existing departments, according to size. Management is represented by the department

head, who acts as chairman, foremen and chargehands. Employees are represented by the shop stewards elected. The departmental committees are the backbone of the scheme, and their deliberations will embrace all the problems which call for joint consultation.

The shop stewards from all departmental committees form a separate committee which appoints from its representatives, the people who are to serve on the central committee. The management has a similar committee of departmental heads so that all representatives—worker or management—are fully conversant with current policy.

Sub-committees may be set up, however, to deal with matters which cannot be conveniently handled by the Joint Advisory Council, or departmental committees. When the need for such sub-committees ceases, they are automatically dissolved.

The election of employee representation takes place in two stages. First, the company provides facilities in the works for the election of shop stewards in accordance with T.U. regulations. And secondly, the shop stewards so elected stand as candidates for the departmental committees. At the second election, every hourly paid employee over the age of 18 whether trade unionist or not, is entitled to vote.

The interest which the plan has aroused in all departments of the factory, is a tribute to

Please turn to page 104

RAILWAYS

Servant of Industry—yes. But railway men earn £200,000,000 a year; consumer potential. Railways own chains of hotels, restaurants, run a 40,000 road fleet, own docks and wharves at 76 ports. Yes, undoubtedly a servant; but what a customer!

By R. W. HUNTER



The Lifelines of Industry

FOR six long years of the dark night of war the wheels of Britain's railways kept turning. Through fog, snow, rain, hail—in the glare of piercing sunshine, in the chiselled cold silhouette of moonlight—bombed and blasted—the wheels kept ever turning hauling their huge loads of crowded war-tired humanity, some in service dress, others in civilian garb, transporting vast tonnages of guns, tanks, rifles, food, aircraft, petrol, ammunition, factory supplies and products, bombs, mines, shells, in endless stream towards their destination.

Trains travelled routes which never appear on any time-table; 1,120 special trains alone were needed to convey the First Army on its way to North Africa. Six hundred and twenty "ghost" trains suddenly had to materialise to bring back Britain's Dunkirk veterans from seven South-East England ports. Every 37 minutes a 12-ton steel-framed wagon rolled out from railway assembly works to meet a double-quick-time demand for 1,600 of them overseas.

Engines long due for complete overhaul, as faithful to their task as if made of flesh and blood, kept hauling till they could haul no more. Instantly another engine took the load. On the footplate of every engine, by the side of every driver, stood the spirit of George Stephenson.

Britain's railways had a date with Destiny. They kept it.

On D-Day the full might of the armies of

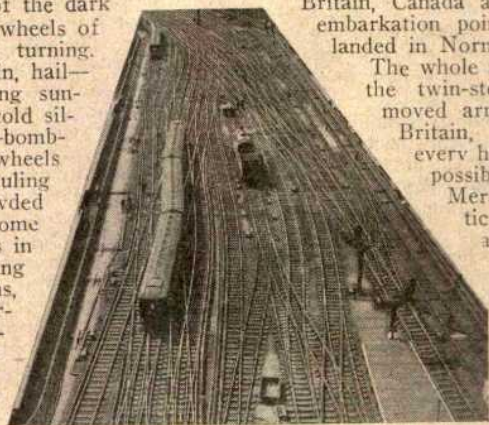
Britain, Canada and America, conveyed to embarkation points by Britain's railways, landed in Normandy.

The whole story of how the railways, the twin-steel life-lines of Britain, moved armies, fed every mouth in Britain, supplied factories, kept every home fireside burning, made possible the maintenance of the Merchant Marine's trans-Atlantic life-line, helped to build airfields, and, at the same time, turned their available workshops over to making armaments, including even fast motor craft and two-man midget submarines, will make a book.

And now the green flag is hoisted the starting signal is off, for the start on what may be the greatest advance in British railroad engineering since that which occurred when British engineers led the world in development following on the opening of the first public railway between Stockton and Darlington on 27th September 1825.

Already, plans and blue-prints for progressive development which were pigeon-holed at the outbreak of war have been brought out and dusted, despite the staff deficiency in technicians who are still on overseas service. At the time of writing, the L.N.E.R. have announced their plan to electrify the Sheffield-Manchester section of their line.

The G.W.R., which led the way in increased boiler pressures on British railways more than forty years ago, have recently completed at their historic locomotive centre at Swindon a new



engine in which the most striking new boiler feature is the raising of the working pressure to 280 lbs. per sq. inch. The L.M.S., after extensive research and time-study analysis recently constructed two new goods sheds at Birmingham and Derby for speedy modern handling of goods. The Southern's newly-designed passenger coach has been exhibited, and luggage vans made largely of plastics have made their appearance.

These items selected at random are only indicative of the initiation of vast modernisation and efficiency plans. All railways are intensively studying and planning track, rolling-stock, tractive power, station, freight facility, and signalling improvements.

Necessitous running repairs have been made throughout the war, but, naturally, normal repairs, complete overhauls, and replacements which would occur annually in peacetime have accumulated. Facing the railways is a period of rehabilitation and readjustment in which to make good the ravages of nearly six years of wartime operation.

A considerable amount of main line, and branch line tracks will need to be replaced before pre-war speed standards can be regained. Rolling stock converted for war purposes, such as ambulance trains will require to be reconverted. Approximately six hundred miles of sidings are occupied by waggons under and awaiting repair and reversion. At the time of writing there are about 90,000 railway waggons and 66,000 requisitioned waggons under and awaiting repair, a considerable increase over the numbers of a year ago.

War-time losses in locomotives and rolling stock, quite apart from new construction, consisting of 216 engines (8 lost in air raids), 635 passenger vehicles and 2,680 waggons, both of which were lost by enemy action, require to be made good.

While an early start on cleaning up and re-painting Britain's 6,500 railway stations will be made depending on available labour, the pre-war plan of rebuilding hundreds of stations on modern lines, and the reconstructing of the entire layout of termini, must of necessity be deferred.

The gallonage in paint alone which the railways will need for both rolling stock and stations is astronomical.

What is a railway? Theoretically, it consists, except in mono-rail systems, of two rails upon which rolling-stock, drawn by one or more horse-power, conveys goods and passengers from one or more points to other points. But there the theory stops.

Giant Organisation

British railways own and manage 53 hotels, operate 767 refreshment, dining and tea-rooms, run up-to-date laundries, feed, care for, and harness nearly 11,000 horses, operate over 40,000 parcels and goods road vehicles. Each company has a fully-constituted police force. Six hundred miles of canals are owned by the railways. Staff canteens alone would form in number quite a formidable restaurant chain. They have dock, harbours, and wharf accommodation at 76 places with 95 miles of quays. One company alone handled a tonnage of 15,229,486 at its docks in the year 1944.

Under large railway termini are veritable departmental stores. Little do passengers suspect as they hurry for their trains that underneath their feet an underground world is functioning.

We are told that an American once feared the speed of our trains lest they run off our little island. They do, in effect. At the outbreak of war the railways operated 130 steamers with an aggregate tonnage of 176,145.

There are many angles to the relationship between industry and railways:—Transportation of inward supplies and outward products, Transportation (in many instances) of employees, Travel of executives and representatives, and—The Spending Power of the railways as it affects sales of factory and industrial products.

Looked at from the angle of purchasing power—the main line railways and London Transport normally spend over £53,000,000 each year on stores. To gain a full picture of the present potential one must take account of the war-time arrears in the present rehabilitation programme.

PASSENGER COMFORT IN RESTAURANT & LOUNGE CAR



If we may be permitted to indulge in an Irishism—the four railway systems are the greatest single industrial buying power in Britain. Even lighthouse-keeping and lighthouse-building is dependent on rail transport!

Tin tacks, mouse-traps, common household pins, frying pans, and rubber bands (when available!) seem monstrously out of relationship to a giant-powered locomotive. Yet they are essential to the efficient operation of railways. Even tallow and candles we found on the endless list of small stores.

The cloth for uniforms in a normal year totals four million yards, and that does not include white drill suits. Selling wall-paper to a railway might seem strange, but for the fact that the main line railways and London Transport own 51,000 houses.

Manifold problems face railway engineers and executives in looking into the future. Euclid with his triangles, theorems, and corollaries, had a simple job by comparison. No question of tractive power, friction, adhesion, air resistance, or soot-lined locomotive smokebox tubes, intruded over his horizon, preventing him from following the tortuous even tenor of his ways. With the utmost simplicity of his line being the shortest distance between two points, Euclid simply travelled from A to B. And (much to the regret of every schoolboy!) an atom bomb did not drop from the blue into the middle of his theorem and upset all his calculations.

To what extent should British railways in the absence of sufficient water power be electrified? What lines should have diesel-electric tractive power—every line has a different problem in gradients and trainloads? Which branch lines, or main line special services, should have diesel railcars? The comparative economy in operating costs between coal-burning and oil-burning steam locomotives? Increase of line capacity enabling more tonnage, more passengers, to pass over in a given time? Up-to-date revision of operating control equipment and layout? Modernisation of passenger and goods rolling stock? Revision of signalling systems including the safety factor? Automatic brakes for goods wagons to enable higher speeds of goods trains? These are a few of the main

problems facing railway engineers, quite apart from the post-war rehabilitation factors.

These various problems are of intimate interest to industry, although not from a technical but a comparative effect point of view. The railways are the life-line of Britain's internal trade and industry, and are the life-line to the sea of Britain's export trade. Speed of delivery of products to the nth degree of efficiency, and the most economic cost of transporting such products are of supreme interest both to industry and to the national economy in Britain's post-war recovery. And, as a corollary, it follows that any excess over such economic cost, in so far as it affects cost of living, becomes pyramided in the wage structure.

Electricity v. Coal

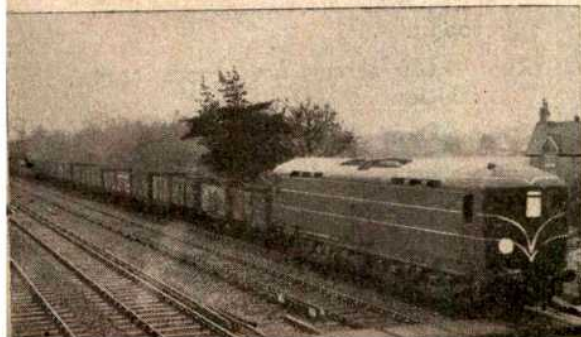
Over all, lies the question as it affects the national economy, of the usage of coal as the basis of steam motive power—railways use approximately 15,500,000 tons a year—both from the point of view of the exhaustion of the national resource (at present consumption coal reserves will last only 100 years), and also of economic wastage by such form of usage.

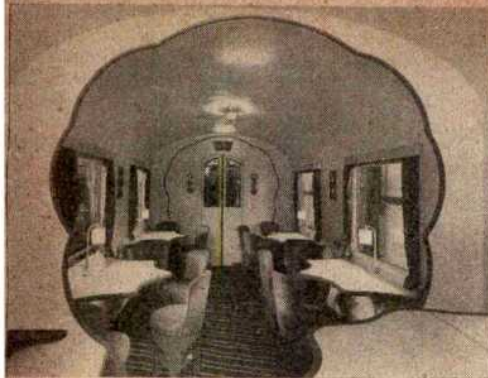
Each of the railways had extensive experimental and research departments before the war on which they spent a million pounds annually. Progressive steps towards replacement of steam tractive power have been taken, the most recently-announced being the first main-line electrification for all traffic of the L.N.E.R. Sheffield-Manchester route, and the G.W.R. conversion of 18 locomotives to oil-burning. The war interrupted important electrification plans in the London and Home Counties areas. Electric locomotives and diesel engined railcars took the place of steam trains on certain lines.

The post-war factor of the higher cost of coal will intimately affect railroad engineering plans.

Of particular interest, therefore, are the views of Mr. Wakefield Adam, Member of the Institute of Mechanical Engineers, and chairman of several companies, who has made a careful study of questions relating to fuel, power and railway transport, and has also devoted close

ELECTRIC LOCO-85 TRUCK HAUL—PLEASANT STATIONS—





The Buffet car of tomorrow designed for creature comfort in new materials and modern design

tudy to the conservation of Britain's coal resources. For more than 15 years before the war he was the special foreign representative and technical adviser to the Breda Company of Milan, specialising in railway electrification, steam and electric locomotives, large hydro-electric power stations and aircraft construction. Possessing practical training as a locomotive engineer, he has been associated with the Westinghouse Companies and his railroad experience is world-wide.

Mr. Wakefield Adam expresses the definite opinion that, despite Britain not having been gifted by Nature as have other countries with immense sources of waterpower, British railway systems should be electrified. Economy of operation, efficiency of operation, the health of the community, the destructive effect of smoke fumes and deposits on property in general, and the saving of the wastage in coal-burning, and the conversion of such wastage into a revenue in the national economy, form the basis of his views.

Smoke and soot destruction from all sources costs the country fifty million pounds per annum, estimates Mr. Adam, of which, railway steam locomotives contribute several million pounds. As one small instance of the corrosive effect of smoke fumes and moisture, he cites the alloys used in connection with signal cables in tunnels, the metal pulleys having been subjected to much corrosion. The corrosive effect also affects passengers' clothing and rolling stock, quite apart from its effect on agriculture and industrial establishments. The health detriment to industrial employees' efficiency, both from the respiratory effects and deprivation of natural sunlight, is not capable of measurement. Over 2,000 coal tar derivatives are obtainable from coal, including heavy and light oils, raw materials for plastics, sulphonamide, paints, enamels, and even plastics for making textiles for use in passenger coach furnishings. Comparatively few people realise that the ratio of output of energy to effective work done in the steam locomotive does not yet exceed 12 per cent! Most of the economic wealth in these coal derivatives goes up the engine chimney.

Nearly ten million tons of coal a year, Mr. Adam estimates would be saved by electrification of British railways, and railways would no longer need to haul coal to locomotive bunkers. He estimates the processed value of the coal saved would be £24,000,000. The Weir Committee report of 1931 estimated a saving in railway operating costs of £17½ million. At the Vienna Power Conference in 1938 engineers LeClerc and Parodi stated electrification on French State Railways showed an actual reduction in operating costs of 50 per cent. Approximate cost in labour and materials of electrification of British railways would be £325 million. Surveys of tidal barrage schemes as further sources of electrical energy should be undertaken.

Authoritative railway engineering opinion is in agreement with Mr. Adam on the greater overall efficiency of electric traction of 14 to 15 per cent. The principal deterrent to whole-sale electrification in Britain has been the increased capital cost.

For every 20 lbs. of coal converted to electrical power, an electric locomotive would perform the same effective work, as 100 lbs. consumed by a steam locomotive.

The prime interest of industrial enterprises is in economy of operation, and efficiency of operation, as affecting costs of transportation of supplies and products, with a secondary interest in any wastage in the national economy. Mr. Cecil J. Allen, M.Inst.T., A.I.Loco.E., supports Mr. Adam in his opinion that the loose-coupled unbraked-throughout-the-train goods trains offer a hopeless bar to real progress in British railway speeds. (Pre-war 678 vacuum-braked trains per 24 hrs. were operated.)

Electrification would enable Britain's main line capacity to be doubled, of particular value from an efficiency point of view, says Mr. Adam, where the traffic is heavy. Suburban line capacity could increase up to 3½ times. A 3,000-volt D.C. locomotive has more than double the power of a steam engine of the same weight. The Southern Railway (600-volt D.C.) prior to electrification estimated that if a gain of 6 per cent in traffic capacity was accomplished, elec-

British Railways

- Own 53 hotels.
- Operate 767 refreshment and tea rooms.
- Run 40,000 parcels and goods road vehicles.
- Own 600 miles of canals.
- Run a giant chain of workers' canteens.
- At 76 ports possess docks, harbours and wharves with 95 miles of quays.
- British railwaymen earn more than £20,000,000 per annum.

trification would pay for itself. The first year showed a gain of 23 per cent.

Overall greater speed of both goods and passenger transportation would also be effected by electrification. Branch lines having insufficient traffic to justify electrification, would be served by diesel-electric trains also with a considerable speed-up in goods and passenger traffic. Shunting and branch line goods engines could be diesel according to circumstance. Diesel-cars and -units already operated in Britain exhibited great efficiency. (G.W.R. fleet, started experimentally in 1934, were covering a million miles a year.)

We are aware, in concluding a summary of Mr. Adam's opinion on electrification, that there are various schools of thought, even in the realms of steam propulsion. Information is naturally not fully available whether the railway's financial structure imposed limitations on a larger electrification programme than was contemplated at the outbreak of war. Electric trains had already displaced steam passenger trains on 2,387 miles of main line in Britain, chiefly in the suburban areas around London, Manchester, Merseyside and Tyneside, but also on the Southern Railway. The conversion of further lines for use by electric passenger trains was actively in hand, but stopped, at the outbreak of war. New types of powerful electric goods locomotives were in course of construction in 1939. The railways are now re-assessing the position as regards economies in operation, etc., in the light of post-war conditions.

Travel of Tomorrow

Plastics will play a great part in railway equipment. We may yet see the engineer and fireman clothed in "water"-proof plastic material overalls, capable of being sponged-off clean of dirt at the end of a journey.

Communication cord tubes, luggage racks, lavatory seats, air-conditioning ducts, panelling, blinds, blind retainers, roof ventilators, mirror frames, interior door handles, coat hooks, locomotive packing glands and control handles and wheels where low heat conductivity is a factor, are a few of the fields of employment. "Need your journey be monotonous"—may be answered on the gloomiest of days by plastic carriage materials of every shade and hue of the rainbow. Carriage seats can be upholstered with plastic material of extremely hard-wearing properties. Plastic signal cable pulleys after 18 months' use in tunnels were still in very good condition.

The business executive may yet "roll home" on plastics. Numerous experiments were conducted pre-war on the use of plastics for railway rolling-stock bearings. In an American steel mill it was found that the useful life of plastic bearings was 10/15 times as great as bronze and the economy of 25 per cent in power consumption was realised.

Railway steamers, hotels, docks and offices provide further fields. Some day the giant levers of all signal boxes may be perhaps replaced by small plastic switches on a signal "key-board."



He looks ahead. His hand rests on the special automatic safety-driving control

When George Stephenson launched his *Rocket* engine on its epoch-making journey, did he visualise that railways would span the globe, did he foresee the massive undertaking which would grow from that small beginning? Did he know that twin-steel rails would become British industry's life-line?

Beneath a simple tablet in a Chesterfield church George Stephenson, the father of rail-roading lies content, secure in knowledge of the sure and strong foundation which he laid for British railway engineering.

The potential in spending power of railwaymen and their families in wages almost touches two hundred million pounds a year. Like all other households they need replacement in clothing, furniture, carpets, rugs, pots, pans, china, linen, bedding, and are prepared to spend their money on labour-saving devices, cycles, radio and other luxuries as soon as supplies are available.

Much depends in the railways rehabilitation programme not only on adequate supplies of materials, but also on release of 110,000 trainee railwaymen from the Forces, of which 30,000 are immediately needed. All credit to temporary war employees who have earned their laurels. But behind Will Fyffe's humorous claim to have had to polish the railway line for years as a porter before getting promoted to guard on the Highland Railway lies a great truism in railroading. A railwayman cannot be made in a day or a year!



LOOK-OUT for NEW IDEAS

● Process for Paper.—

A new groundwood bleaching process which, it is claimed, will expand newsprint and other paper manufacture is forecast by a Washington company. Groundwood has been used mainly for newsprint, but the company discovered recently

how to bleach groundwood with a sodium peroxide solution which makes the paper suitable also for magazines, books, and mimeographing.

● **Better Than One.**—According to Moscow radio, a young Soviet biologist is claiming that by fitting them with a second heart the lives of patients suffering from weakness or disease of the heart can be saved. Experiments which he has successfully made with frogs and other animals, the biologist declares, show that the introduction of a second heart acts like an auxiliary pump, and relieves the strain on the main heart.

● **All of a Piece.**—Departing from the old methods, Britain is now building all-welded destroyers. Now under construction are destroyers of the Crescent class, which are welded throughout. Three of them have been launched—and are still floating.

● **Why Work?**—The newly formed Mathematics Division of the Department of Scientific and Industrial Research is working on a calculating machine which, if experiments are successful, will not only be able to add, multiply and divide, but from instructions previously put into it will be able to decide what it should do in different circumstances.

● **Bigger and Better.**—A new super-cyclotron which may "open up a new realm of the atom" will be completed next summer at an American university. The machine will be five times as powerful as any existing atom smasher, and it is predicted that it will make available enormous energies and permit research which may revolutionise biology, medicine, chemistry and agriculture.

● **This'll Shake You.**—A machine called a "sound oscillator" which kills germs by violently shaking them with sound, has been invented by a Melbourne electrical engineer. Tests have proved that after a few minutes the germs were dead, and after half an hour they were smashed to pieces.

● **Typewriters—31s.** Plastic typewriters, intended for sale at 31s. each, are to be produced by two Bavarian factories. Other German factories are turning out popular cars at £75 each.

● **Porous Glass.**—Construction of the first Soviet porous glass factories has begun in Orjonikidze, Mariupol and Konstantinovka. The new glass constitutes an excellent building material, insulating against heat and sound.

● **To Start Them Talking.**—A plan for short-wave radio-controlled public transport has been submitted to the Ministry of War Transport by the Municipal Tramways and Transport Association. The idea is that bus and tram drivers would be in immediate two-way touch with headquarters, and exchange information and instructions on queues, traffic blocks, breakdowns, accidents, and similar problems.

● **Light Relief.**—A large reservoir of natural gas, containing between 80 per cent and 90 per cent of acetylene, and useful for lighting purposes, may soon be exploited in the area round Gogha, in the Kathiawar Peninsula, about 200 miles north-west of Bombay.

● **Good Chuting.**—A British firm of parachute manufacturers has developed robot parachutes which open automatically at a safe height after pilots have been ejected from 600 m.p.h. planes in the stratosphere. The robot chute is operated by a barometer. This starts a little clockwork motor, which opens the canopy at a height where the pilot can breathe.

● **Weird Weaving.**—The designs on ladies' dresses, the upholstery on chairs, even the nap of rugs may be electrocoated rather than woven, according to a report by an American electric company. The principle is the same as that of the old school physics trick of rubbing a glass rod with a piece of silk, so attracting pieces of paper to the rod.

● **What Next?**—From Australia comes news of an invention which enables an ordinary jeep to fly, from America the story of a flying car. The jeep has a detachable fuselage and autogyro propeller; the car is a streamlined three-wheeler about the size of an ordinary saloon.

● **There Before the Frost.**—Mist and frost formation on glass and the like is prevented by the formation on it, as an exposed surface, of a layer of a composition prepared essentially from a transparent water-absorbent adhesive substance. Application has been made for the patent of the idea.

The test of an efficient industry is what its people get out of it.—

Lewis C. Ord.



Wingets Contend

The Customer Must Have What He Wants

And We Switched over to Give it

By **GEORGE DICKSON, O.B.E.**
Managing Director, Winget Ltd.

WHAT'S the good of trying to talk about the affairs of one firm in an article of two thousand words to-day? It would need the volumes of the Encyclopaedia Britannica and the pen of a Charles Dickens or a Gibbon to attempt the job. Then you would be bound to high-light some points of personal preference and miss out millions of valuable details.

These details are all vitally essential to the study of any private limited company and its people going successfully into, through, and out of a condition of total war lasting for five years in a political democracy.

I would like, for instance, to talk about one of our fellows who seems to wish with all his heart that we could get a Winget football team going again so that he could be chosen to play centre-half.

I would like to talk about two of our young fitters who were close friends but who haven't met for over four years while they have been away in the forces, two who are both desperately eager to get back to work in the Assembly Department at a good steady wage so that they can each get married—a notion that hardly

troubled either of them before they left home.

I would like also to talk about one of our shareholders in particular who owns shares in a lot of other concerns as well as ours, and who is, I think more excited about what we are now trying to do to evolve a satisfactory system of democratic control in Winget Ltd., than he is about almost anything else. Wise man.

I would like to mention our new ideas about the post-war function of an outside salesman for the firm; how his job is now more to lead the customers to us for satisfaction than to shove our products down their throats—no matter how good the products are.

Then, it would take pages even to start to say how we are now completely convinced that our best Winget products will always be good men and women. I would rather say that than emphasise the up-to-date and economical articles that these better men and women do automatically produce.

This would bring in a whole lot about the future of apprenticeship and other schemes for general education and training, schemes we are hoping to develop very fully with the new Edu-

cation Authorities now set up in every local district under the new Education Act.

Then I would like to give a long lecture about the case for and against the Trades Union Movement trying to organise Supervisory, Clerical and Technical Workers.

These odd ideas are all pencillings which must be on the pad of any Managing Director alive to his job and full of optimistic confidence in Britain in 1946. But, as I said, it's useless even to start talking about all that in a short article.

In the years before the war we were convinced that if we could group and pool all the goodwill and brains of all the people on our customer list, or all the folks on our pay-roll, either as wage or salary earners or as dividend expectors, then we just couldn't go wrong as a firm.

There would always be a flow of new life and vigour into the centre from the Consumers through our outside representatives to the Sales Manager; then from the artisan Producers ideas and good-will will flow up through the foremen and superintendents, as well as through our peacetime joint consultative machinery in the factory to the Works Manager.

Then from our well-educated shareholders, and our producers and consumers alike there would be ideas and criticisms about costs, prices and statistics right through to our Accountant or Commercial Manager, and from all three groups, i.e., Consumers, Producers and Investors there should be a steady flow to the places where we concentrated all our ideas about Research, Development and Planning in our Control Room and in our Engineering Department under our Chief Engineer who is our Chief Planner.

It was our pre-war policy, having regard to personal ideas about purely personal affairs, to make available as much as we possibly could about the facts that concerned us as employers in the control and successful management of our firm.

Not only that; there was a standing invitation

for any responsible and representative person in the firm to bring forward, without prejudice any question about facts other than those disclosed automatically on the monthly control sheets that I required to do my particular job of general management as Managing Director of the firm.

Ten Years Advance

We knew that if we wanted healthy democracy in the firm there must be no unreasonable holding back of information vital to the control of the firm. We also knew, of course, as loyal members of the Engineering and Allied Employers' Federation, a great deal about the suspicion and distrust that was in the pre-war industrial atmosphere concerning what was called "the managerial function". We did our utmost as a firm to dispel that distrust in the pre-war years; we tried continually through the widest possible representative group discussion throughout the firm, to stimulate thought about how best to satisfy everyone that there was fair opportunity for effective democratic control in line with the most proficient modern methods of working we could discover.

We were doing not so badly that way when war broke out. But we had a long way to go and if the war had not occurred I estimate that it would have taken at least ten years of patient research and experiment to get us where we are now in regard to efficient democratic control of our Winget business . . . and we have still a very long way to go before any of us will be anything like satisfied—either as employers or employees.

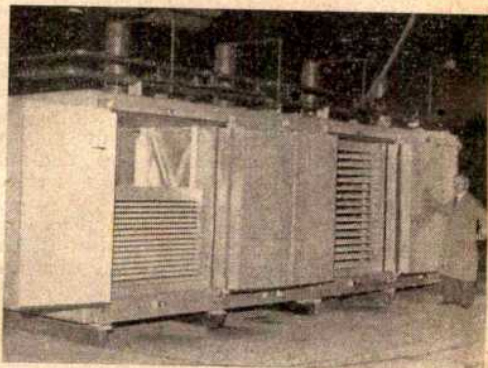
You see, by any standards of comparison, ours is not a very easy firm to manage. Any management consultant looking at the rough picture of what we are trying to do would immediately say that we make and offer for sale far too many different types of Winget products.

He would probably suggest that we should

FROM WAR



TO PEACE

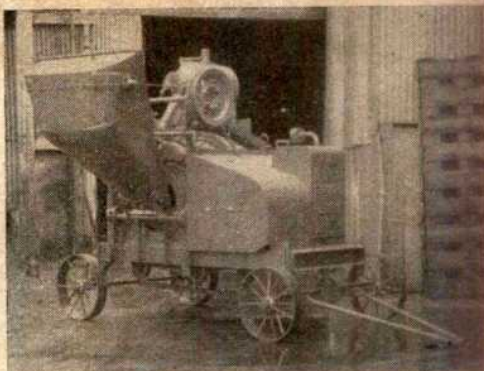


Modernity in two spheres—the tank and the quick-freezing units. The uses of the former are on record. The latter were used to freeze last season's herring's at Fraserburgh and Yarmouth

DESTRUCTION



RECONSTRUCTION



Emblematical of opposites. Both products of Wingets' factories, the gun gives place to the tools of construction

standardise much more than we do on the lines we offer for sale. Good idea! Cut out a lot of the different things we offer to our customers' individual choice. As one of those fellows once said to us: "Tell them they can have any colour they like so long as it is black."

But, no fear. We have our own ideas on methods and standards. We have our own experts and specialists on that job. We like standardised methods of operation and we like standardised parts to build up from.

We Like it the Hard Way

The last thing we should like, however, would be to try to limit the range of our output to suit our particular convenience at the expense of the convenience of our good customers who are the essential basis of our Winget prosperity.

That would be very dull. So, we prefer the production affairs of the firm to be difficult to manage. As a matter of fact that was actually why we did such a good job during the war. We were able, as the pictures show you, to take on a great many jobs that were too much of a nuisance for the larger mass-production firms, and too difficult for the smaller firms to cope with on their limited resources of technique and plant.

We did it on a group pattern of democratic control that balanced equally our Consumer Needs with our Producer Resources; and the economics or past financial history of the firm, balanced the Research, Development and Planning work we tried our best to keep going, not only on our day-to-day affairs, but also in relation to our long term business.

I have said already that it would be impossible even to start to write about the affairs of our firm in detail. In any case, who would be interested? But, here I think is the chief lesson that has been driven home through our wartime Winget experience.

We already knew in pre-war days that our job was to find and operate the best possible democratic group methods of balancing our

Sales with our Production, our Finance with our Planning.

We knew that meant a tremendous amount of willing "Giving" on the part of everyone in the firm. But we wanted that, for we recognised that the only cohesive force in human life is "Giving", and we wanted to work in harmony with that force. But, what we did not realise clearly enough in pre-war days was this:—

It was no good just a few idealists around the firm having grand ideas about the purpose of the firm and the ambitions of all the persons in it. We had to get a common objective for everyone to work to, a common objective that even the most illiterate or ill-tempered person on our pay-roll couldn't deny he or she agreed to.

So, during the war, especially after Dunkirk which happened to be not a great many nervous miles from our factory gate in Kent, we learned that with a common objective like "Win the War," an objective that everyone could understand and work to, we had stumbled on the final answer to our problem.

We had, therefore, to find in peacetime, as we had found in war, a common objective for every person in the firm, and that common objective had to be clearly understood and clearly stated as the Highest Common Factor of our common interest in the firm.

We did a great deal of thinking about this peacetime common objective idea. And we did our thinking during the war. So that, away back in the Spring of 1944 when we were on our last task for the "D-Day" invasion which was pretty obvious final news in Southern England, we got all our folks in little groups together all over the place, and, after infinite discussion, agreed the following first objective for the firm in peacetime: We must set ourselves the task of providing steady democratic employment under Fair wages and conditions for one thousand persons by making financial ends meet in producing and distributing the highest possible quality goods at the lowest possible prices.

Please turn to page 102

Business Calling . . .

Quotes the Policy of Leaders Helping to Shape Peace Plans

LORD WARDINGTON

A Policy for Export



THE Right Hon. Lord Wardington, chairman of the Bank of London and South America Ltd., gives business some pointers for export policy. "A market once lost is difficult to regain, and therefore British export policy should be two-fold," he says. "First, no effort should be spared to enable British manufacturers to export to Latin America without delay—even if only by token ship-

ments—so as to establish a bridgehead; secondly, longer-term policy should be aimed at expanding from that bridgehead for, after the present pent-up import demand has been filled over the next two years or so, the South American markets may be expected to become as fiercely competitive as ever, accentuated by the abnormal growth of local manufacturing industries. Even before the war British export trade with Latin America was steadily declining, and if a more aggressive sales policy was needed then, it will certainly be much more vitally necessary in the future."

SIR THOMAS KEENS

Post-War Housing Problems



VIEWS on the way to meet the housing shortage come from Sir Thomas Keens, D.L., chairman of the Ideal Building and Land Developing Company Ltd. "For some time past," he says, "we have given considerable thought to the provision of post-war houses. We decided against embarking upon a programme of prefabricated houses, and have concentrated our plans on building

permanent brick houses. Pre-fabricated houses may make a contribution to the immediate need, but the board are convinced that the public will never be satisfied with these temporary expedients when they have an opportunity of acquiring permanent structures built with traditional

Sir Thomas goes on to make an interesting observation on the relation between private and public enterprise in the building industry. "Whilst," he says, "it is the considered opinion of the board, based upon their pre-war experience, that the solution of the pressing problem of housing depends upon a fair field being allowed for private enterprise and the provision of adequate labour and materials, we are nevertheless convinced that the course upon which we have embarked, that is, close co-operation with the local authorities in whose areas we have land with roads and sewers, is not only desirable but, indeed, the only practicable course to be followed."

SIR EDWARD BARON

Technical Education



THAT some firms are alive to the crying need for more technical education in this country is proved by the example of Carreras Ltd., whose chairman and managing director, Sir Edward Baron, states: "As part of our post-war policy we have provided special technical courses and a day continuation school, one or other of which is attended by every employee under the age of 18. Classes

are held during working hours and the company pays full wages. All this is appreciated by the young people and by the parents, to whom we explained our plans. Our educational schemes have a real practical purpose. We do not know what many of our employees are capable of. We believe that they possess talent and skill which we trust will be brought out through the opportunities provided. All this, I think, reflects credit on private enterprise."

Mr. I. A. R. STEDEFORD

Industrial Design

TO hold our own in the keen world competition which is bound to follow, productive efficiency alone is not enough," declares Mr. I. A. R. Stedeford, chairman and managing director of Tube Investments Ltd. He con-

facturing at low costs; it requires that the product manufactured must compete in the world's markets not only in price and performance but also in appearance. In this connexion, the recent move by the Board of Trade to institute the Council of Industrial Design is much welcomed by those in industry who appreciate the fundamental influence of design in winning and holding overseas markets. I feel, however, that there is a need for extending the scope of this Council if it is to achieve the results the country requires. Good design will not result by merely impressing an industrialist with the need of it.

"There is a difficulty in finding industrial designers in this country who, in addition to the necessary 'flair,' have a general knowledge of the problems of production. Industry should be able to brief industrial designers in this country with equal confidence as members of a recognised profession practised by those who have received—in addition to their gifts from heaven—an appropriate technical training. We have learned from sad experience that good artists can produce admirable designs, but too often the first principles of industrial production have been ignored."

Mr. E. RIDDEL

Safeguard Skilled Workers



"IF, as a country, we are to produce the maximum quantity of peace-time goods of the highest quality and at competitive prices in the markets of the world, it surely goods without saying that it is a first necessity to preserve intact the skilled personnel of industrial concerns such as ours. It has indeed been said that one of the most important assets of a business is not shown on the balance-sheet

—that is, its personnel—and never has the truth of this been more obvious than when this asset is threatened."

This is the opinion of Mr. E. Riddel, J.P., chairman of William Neill & Son (St. Helens) Ltd., specialists in the production of the heavier units of chemical, petroleum, iron and steel-works and soap manufacturing plant.

"From the inception of the company the directors have always realised the need for the training of apprentices, because a constant influx of skilled workers is a prime necessity to an expanding business. We have pursued this policy vigorously and deliberately for very many years, and have accumulated a most valuable reserve of fully trained men and youths in the course of training.

"We are now experiencing the withdrawal of a considerable number of these young trainees and young fully trained men (Mr. Riddel was speaking at the eighth ordinary meeting of his company) and I cannot over-emphasize that a policy of withdrawals of this kind is bound to have a serious effect upon our productive

Mr. W. McCLELLAND

Specialised Products



THAT the break-up of mid European scientific instrument production points the need to provide specialised products for the home and export markets is the opinion of Mr. W. McClelland, C.B., O.B.E., M.I.E.E., chairman of Aeronautical and General Instruments Ltd. "Our general policy," he says, "is to provide the unique and specialised article, possibly in limited quantities,

rather than the article of universal demand manufactured on mass production lines. The whole history of the company has been based on this conception, and it is the board's considered opinion that our future products should represent a continuance of this policy.

"Secondly, and as a corollary to our primary policy, we have built up an organisation that is substantially self-contained as a manufacturing unit and so dependent only on the so-called 'raw' materials. For example, our optical instruments are not the products resulting from the mere assembly of bought-in components, but represent the precision machining of metal parts, the accurate grinding and polishing of the lenses, the photo-etching of gratules, the cutting of fine gears, the making of shutter mechanisms, the provision of woodworking, enamelling and plating facilities and the production of special tool kits, supplied with the instruments."

SIR JOSEPH NAPIER

Something to Think About



TWO problems for the cotton industry's Working Party are spotlighted by Sir Joseph Napier, Bt., chairman of the Yorkshire Dyeing and Proofing Company Ltd. "One of these," he says, "is redundancy. To be effective we think that any redundancy scheme must have statutory backing, because it must incorporate a compulsory levy to finance the scheme. At the

same time the compulsory should not apply to the sale of works, this remaining at the option of the proprietors. Any such scheme, of course, would have to provide many safeguards in the interests of the community.

"Another problem which the Working Party might consider arises from the recent practice in this trade of raising the wages of the unskilled worker almost to the level of the skilled operative. The effect of this requires reviewing because it kills rather than fosters the incentive to take responsibility, and this, of

Executives' BRAINS TRUST



There are Rule Books and . . .

1 We have just issued a small, as we thought tactfully written, book of office rules for our 200 office employees. The reception has been bad. I asked one intelligent girl whether she thought they would help her. She replied "No. I took them home to let Mum read them last night, and Mum said, 'Wher're you working now—Borstal?' "

Can the Brains Trust suggest a method of offsetting this unfortunate reception.

GUEST MEMBER: Can they identify this set of rules with the present behaviour of the staff? Is there any marked difference between the two at the present time? If they can prove that all they're doing is to put it on record for new employees, they can probably overcome the bad reception.

Rules may look far worse in black and white than they actually are in operation.

MR. LEVER: No doubt during the war they have been lax, due to the type of staff they have had to employ. It would have been better if they had called all the departmental heads together and explained the rules to them point by point, telling them in turn to explain them to their own employees, before issuing the rules.

However tactfully rules are written, they should have been explained verbally.

Q.M. CHISHOLM: It is too late for that now. This is a very general problem in post-war re-organising.

GUEST MEMBER: As the objections are coming from the employees, not from the administration, couldn't they get a small representative body from the 200 girls and discuss the matter with them, hear what the objections are, find what suggestions they have to make. Then they will feel that they have played a part in the framing of the book.

MR. FORD: At this stage they could call a

MR. ELLIS: That would be to suggest a crisis. If they have a staff council that is the obvious avenue to use. I would like to know more about the rules before giving advice to them.

MR. FORD: If they are in the habit of calling meetings, it will not look like a crisis.

Q.M. CHISHOLM: The Brains Trust suggests that a meeting of staff should be called, at which they could go through the book of rules carefully, and give the reasons for issuing it.

What Can We Make?

2 We operate a large amusement park and catering business at the seaside, which is only open for a third of the year, consequently our staff are employed for the season only. It has been suggested that we operate some light industries during the winter and give the staff employment all the year round. As we are quite inexperienced in manufacturing and marketing, can the Brains Trust give some guidance as to how to act about it, and from where to obtain advice?

MR. LEVER: Would it not be possible for them to extend their season over, say, six consecutive months. Holidays with pay will help this in future.

Q.M. CHISHOLM: No, I don't think that is possible. These organisations work to peak loads, not partial loads. They can't get a peak load outside the four holiday months.

GUEST MEMBER: Even if they are not operating all the year they will have to keep a nucleus staff in being throughout the whole year.

MR. ELLIS: They should get a sub-contract.

MR. FORD: That was easy during the war, but it may not be so easy now. If the Regional Offices are to remain in being, they should get



... These are the Questions

- 1 How can we make our rule book popular?
- 2 Can we start a seasonal industry?
- 3 Must we over-pay the ex-officer?
- 4 Must we export all first-class designs?
- 5 Does a Pilot Office reveal shortcomings?
- 6 How do we get back to office efficiency?

formerly run by the M.A.P., are now working on just this sort of problem for the B.O.T.

MR. ELLIS: I suggest that they take a finishing assembly job. They should avoid anything which requires stocking of raw materials, or finished goods. Possibly they could obtain advice from the Board of Trade.

MR. FORD: They might get an assembly job from an aircraft factory.

GUEST MEMBER: When thinking of assembly work, you must also relate it to lines subject to peak fluctuation during their shut down period—radio, for example—this also might be suitable as they will doubtless have maintenance electricians from which to form a nucleus shop supervision. Top administration in this type of undertaking are usually pretty shrewd people, and should be capable of tackling such a problem on a sub-contract basis.

MR. FORD: They could go into simple plastics. It doesn't take much ingenuity to operate some of the processes.

MR. ELLIS: Yes, but that usually involves heavy presses employing little labour. I think light, seasonal assembly is the thing.

GUEST MEMBER: Unless they can link with some other organisation on the basis of dealing with seasonal trade, it is unlikely that they will get the necessary equipment.

MR. ELLIS: The most plant they could instal would be tables, chairs, bins, and perhaps small conveyor assembly belts.

Q.M. CHISHOLM: The Brains Trust suggests that they write to their Regional Office, or the Board of Trade. They should take on light assembly work of a seasonal nature, e.g. radio. And they should contact local engineering and electrical firms on the subject.

Ex-Officer Problems

3 We are extremely perplexed with the problem of our 30-40 returned ex-officers of all Services who were clerks, junior salesmen and lower executives at anything from

to the value of anything from £650-1,100. The majority of those men I feel we need. Normally we would pay them £400-500 a year. I feel we ought to be paying them £750-1,000 a year. Is there any means by which we can do it and justify the expense? (I should say that financially there is no difficulty as this is a large concern with heavy reserves.)

MR. LEVER: If a man has climbed to a high rank in the Services it is safe to say that that man has got something in him, and perhaps that has not been discovered by his pre-war employer. But if a man has earned £1,000 a year in the Services that does not automatically entitle him to the same rate of pay in civilian life. All it gives is an indication as to his probable ability. After all in the Services pay one must consider the element of what one might call "risk money," or "inconvenience money."

I feel that each case has got to be dealt with on its own merits. It is altogether wrong to consider only putting a man back in the job that he left.

GUEST MEMBER: The rules which govern the reinstatement of employees say that the men are entitled to claim the salary that they might have earned had they never left the organisation. I doubt whether the progress these men would have made in normal employment would have been as rapid as that made during their Service career.

I think it would be better to offer them £450 for a probationary period, then if events confirm they have the necessary qualifications, their salary could be increased to the proposed figure. This would obviate friction with persons less fortunate who are being reinstated, and possibly present employees.

Q.M. CHISHOLM: This firm has had the experience of offering their men £650 instead of the usual £450, and being turned down.

GUEST MEMBER: If a man is not prepared to accept the company's assurances, then they are better off without him.

MR. FORD: I talked this over with a managing director of a Sheffield steel works. He said: "We know that plenty of these people have proved themselves during the war as having some capabilities. We're offering them something half way between what they were

expect anything for the first year, but if they have got the necessary qualifications they will eventually prove themselves. That is the logical way to deal with it."

Q.M. CHISHOLM: I know a managing director who is always prepared to pay a man knowingly a little more than he is worth for three to four years, if he feels that in all probability he may be paying him less at times during another 14-15 years.

I don't think that the English administrator understands enough the value of making his able executives happy, and maybe paying them £200 a year more than they could get anywhere else in their industry. When it is done it seems to work.

MR. ELLIS: It is bad for the company, and for the man, if he is given an artificial salary. We have met no resentment from men who were majors during the war and have come back to a lower financial position.

Q.M. CHISHOLM: Much depends on the reputation of the firm, and on the degree of its dependence on first-rate talent as well as technical and commercial ability. The Brains Trust believes that men successful in the Services should be offered a salary half way between their Service pay and their previous peace time pay. Our Guest Member believes in a probationary period only at this figure, and a high figure thereafter.

Utility at Home—Glamour Exported

4 As the result of our wartime increase in factory space, equipment and personnel, we are able to produce our products on a



E. A. LEVER
The Pressed Steel Co. Ltd.

shortened simplified line at attractive prices. We are confident that we can more than hold our own in the home field. The position is reversed abroad. We made our application in the South American market, particularly on our quality and superior finish of our goods (household appliances). We find that the demand for range, quality, finish and beautiful design, what seems to us now almost regardless of cost, remains.

Can the Brains Trust suggest any means by which we can satisfy the demands of our South American friends, while retaining the low-priced mass production for the home market without resorting to dual production.

MR. LEVER: I'm afraid I have not yet heard of an export market which is not price-conscious.

MR. FORD: In the South American field as far as buying from the U.S.A. and Britain is concerned, they would rather buy from us irrespective of cost, because they like the quality of our products. But at the moment delivery is the controlling factor.

GUEST MEMBER: Assuming their basic lines are of sound design and manufactured from good quality materials, it should be possible to cater separately for those details in styling and finish which command a higher price; without introducing entirely new designs, or increasing the cost of the simplified lines, provided separate departments are set up for the finishing operations. To take a case in point, I think I am right in saying that pre-war the Rootes Group based the bodies of the corresponding models of Humber and Talbot Cars on the Hillman 14 design, with slight modifications to such details as luggage lockers, interior trim, etc., thus avoiding duplicated cost of dies and jigs, body assembly lines, etc., whilst still meeting the demands of the higher price range.

Q.M. CHISHOLM: That method could be applied to vacuum cleaners.

MR. FORD: South American customers like high quality goods.

MR. ELLIS: They can improve their design and finish, and add as many gadgets as the market will absorb.

Does a Pilot Office Help?

5 With a view to proving the efficiency or otherwise of the administrative and executive offices in our organisation, and attempt to lower non-productive costs, we have set up a small internal organisation which we have called a Pilot Office. This is highly mechanised and handles a strict percentage of all office work, but it is staffed at one-third of normal office strength. The target was the same output on 66.2/3 per cent reduction of labour.

At the moment the results are inconclusive, but could the Brains Trust say if they have heard of similar experiments. If so, do they reveal unnecessary office overheads?

MR. LEVER: I think a Pilot Office is an unnecessary waste of time. I would say a much

J. P. FORD
General Manager, B.E.S.T.E. Co. Ltd.



have a thorough and continuous management audit.

The most suggestive book on the subject is T. G. Rose's *Management Audit*. He divides the functions of management into production, distribution, development, finance and secretarial, and suggests ways in which the efficiency of each can be examined. Thus, in connection with finance, he considers statistical information and draws up such questions as what method is available by which the monthly changes of stocks and working progress can be ascertained, what method is available by which some factory costs can be ascertained monthly. What method is available by which all expenses other than manufacturing cost can be ascertained monthly, and in fact what general statistics of importance to policy decisions are available. I would couple with any such continuous overhauling of system, an attempt to set up standards of performance, based on data which can be ascertained from various office machinery manufacturers, and certain of the standard office procedure manuals.

GUEST MEMBER: If they are experimenting with mechanisation a comprehensive review of existing practice should first be made, and data compiled as to the periodicity and number of documents or entries being handled, given this it is fairly straightforward to prepare a cost estimate of mechanised alternatives for comparison purposes. Alternatively, select one routine and have a demonstration covering one month's work, running it parallel with existing procedure. Experience gained operating one routine completely will be more conclusive than Pilot operation on all routines.

MR. LEVER: I still think this is going through elaborate motions to achieve something that can

be achieved more reasonably and more cheaply by continuous management audit. I mean a very comprehensive review of every office operation, and a continuous overhauling of system throughout the organisation. It is *thought* they want, not an *office*.

If they are a big organisation I suggest also that it might be worth their while to get in touch with an office management consultant and ascertain his views. Finally, I think what should be aimed at is not lower costs but *minimum* costs.

Office Output Falls Off

6 Like other of your readers we are concerned with the reduced efficiency of our office staff. As an instance we may give you the fact that where the girls in our rather large circularising department formerly addressed 100 envelopes per hour, the current speed is around 40 per hour. This means that a despatch of 3,000 circulars, with enclosures, takes us over three weeks, where it used to take us 8 or 9 days.

The spirit in the office is quite good; most of the chiefs are the same as pre-war; what can we do to get back the old efficiency?

MR. FORD: On a standard job can't they give them a production bonus as an incentive.

GUEST MEMBER: Such a bonus would normally be 25 per cent of present wages, for which to get back to pre-war efficiency more than 100 per cent increase in output is required. I suggest additional incentives such as a shorter working week, provided target outputs are achieved, should be considered, which might also apply to supervision, which seems to have lost its pep.



D. C. ELLIS
Sales Manager, I.C.I. Ltd. (Paisley)

SIR CECIL WEIR

Contact Between British Industry and the Men who are going to Restyle it Says

Distinctive British Goods Will Win World Exports

By FRANK PLACHY

IT was a canny piece of political wisdom that made a practical Scot the liaison officer between British industry and the new official Council of Industrial Design. Such a job obviously called for a man who had proved his capacity by making a success of his own business, had the foresight and the instinct to realise that an old era has departed and a new one is on the threshold, and is yet mentally young enough to grapple with an entirely new set of problems.

Such a man was found in Sir Cecil Weir, Director-General of Equipment and Stores, Ministry of Supply, and a business member of the Industrial and Export Council of the Board of Trade. Sir Cecil's task at the Ministry of Supply, where he has been since 1942—and at the Board of Trade which he entered as an Executive Member of the Export Council in February, 1940—has given him an insight into the productive capacity of British industry, and the managerial talent which makes it tick, which is probably unsurpassed by anyone else in the country.

Between his own widespread business experience, and the long gruelling months at the Ministry of Supply when he might be said to be a spearpoint of production, he has acquired, at 55, a range of view that is vitally needed in rebuilding the national industrial machine.

It is this broad background that makes Sir Cecil's connection with the Council of Industrial Design so suitable. His task will be to help to interpret the practical problems of production and selling to the designers and artists of a whole new range of British products, so new as to be in fact revolutionary, and on the other hand to convince industrialists that it is in their vital interest that goods made for sale either at home or abroad should embody a beauty, style and integrity.

For Sir Cecil, his task will not be a simple one. He says that when the first great design and design is held in London for the people, and the buyers are astonished by the advances in the goods industries. The

frustration of six years of war has not stopped the budding of new ideas, and they are about to flower.

"An overseas observer has said, 'The British have all the good qualities except the most important one—imagination.'" Says Sir Cecil, "Well, we are going to give them a shock. The truth is, of course, that imagination is a quality that can be cultivated, just as wise people cultivate courtesy, thrift and the other desirable virtues.

"We find that we have a great and insufficiently exploited field of splendid talent in this country which has demonstrated its potential qualities during the war and which can be used to increase the desirability and consequently the saleability of our merchandise in world trade. Art for art's sake is all very well, but art for the sake of increasing exports and raking in foreign currencies, and for adding to the beauty of life in products of everyday use is a jolly sight better."

Demand for Style

Sir Cecil says that industrialists in almost every line of production are wholly agreed that British products must henceforth have more style and polish than was considered necessary in the past. They are working with designers in a co-operation that is profitable to both. It goes without saying that advertising agencies and commercial art workers are giving their energies to this work, so that there is no reason to doubt the coming exhibition will be a revelation to all who see it.

"As would be expected," says Sir Cecil, "the new industries such as plastics, artificial textile fabrics and electrical gadgets give the designer and manufacturer more scope than some of the older industries. But in some fields we have always led in design and will do so more certainly in the future. The finer grades of cotton goods in Lancashire and our world-famous wool and linen fabrics give a good example. We may find more difficulty in competing with

a number of overseas countries where long runs on commonplace products are the rule, but we shall certainly have no trouble holding our own on the finer products where craftsmanship and design take the same raw product and turn it into a finished article worth much more than the mass-production output.

"Pottery, china and glassware are other products where we should see great advances, in exports. Before the recent war we were making great strides in this field and should go forward even faster from now on.

"There are two things we must keep constantly before our eyes: the products we offer to the world must be distinctively British, and they must have charm. We must avoid above all being imitative; those we might imitate are too far ahead of us to be overtaken, and besides, tastes change and we are not by nature copyists, and we have every reason to believe that there exists a taste for British ideas in material things, as six years of war proved there was a taste for British ideas of human liberty and decency."

Enterprise Accepts a Challenge

Sir Cecil Weir is something of a rarity in the present day. Although he achieved success in the rugged school of private enterprise, he is adaptable enough to be willing to try to make a success of certain experiments of a more collectivist nature. His relations with the present Board of Trade continue to be totally co-operative on both sides. He says he saw so many miracles achieved by British industry in the course of the war that he is not going to allow himself to be depressed by any incidents which are almost inseparable from the close of such a staggering struggle.

"It is true that we have had the urge of national necessity to spur us on," he says. "It is true that price has been a minor consideration and that there has been no outside competition and a ready market, but the thing to note is that the challenge to produce new and complex commodities and products has been met with ingenuity and enterprise, and that the quality of our war equipment and armaments has been magnificent and our utility commodities above the average in standard. These latter are now to be still further improved as better materials become available, and more variety becomes a practical proposition.

"We have achieved, too, a new spirit in our industrial relationships, a change of outlook which places service even higher than profit, and which recognises that the goal of full employment is worth the shedding of a number of well-established but not necessarily good prejudices.

"The prejudice in favour of private enterprise, which I think is generally held in this country—and which I personally believe, on the whole to be a good one, need not prevent us considering the advantages of an element of public operation in certain spheres, particularly in the public utilities and transport fields, with the object of giving us control over some large capital investment so that such expenditure may be fitted into the national employment



Cautious by nature but a man of decision, Sir Cecil Weir is to tell the manufacturers where the right designers can be found

budget. We should judge these questions on their merits and not according to previously held doctrines.

"We have too, as a people and as a nation, won, and I believe properly earned, a high prestige and a reputation for courage, resource, honour, tolerance and endurance which will help us greatly in our relationships in years to come with our war allies, and with the whole world. The knowledge of what we have been able to do in the factory and on the battlefield is no mean equipment for the days that lie ahead."

One reservation which Sir Cecil makes is that the present tendency of those coming out of war industries, or the Services, to be too "choosy" or selective about the work they are to take up should be strongly discouraged. He points out that the textile trades, iron and steel, coal-mining and shipbuilding and engineering, are the backbone of industry and must have adequate labour forces. As he says, it was always wise in peace-time to choose jobs that carried permanent employment prospects, and that this will hold good in the future.

In view of the natural Scottish caution which Sir Cecil Weir has in abundance, it must be said that an hour's talk with him is a refreshing and cheering experience. Considering how optimistic he is about the future of British industry, and the wide information he has on which to form an opinion, the visitor cannot help coming away with a feeling that things are on the upgrade, and that present difficulties seem magnified by our closeness to them.

MANAGEMENT'S

SLOWLY but surely, the controls on business activities are relaxing, but during this year of 1946, the tempo towards normality will rise progressively as demobilisation helps production to achieve switchover targets.

Old Man Competition therefore begins to make his appearance on the post-war stage, but the basic truth that managements not products are the real producers, is not yet fully appreciated. If a business man is prepared for the future, he need not fear it, but there are ten important controls or measurements which he must understand and know how to apply.

George S. May, chief of George S. May Company, the world's largest firm of business engineers, calls them the Ten Tenets for Better Business. His exhortation to apply them now must be heeded if you value a strategic position on the peace-time market-front.

1. Build a Sound Organisation

EVERY function of management should be clearly and completely specified. The authority and responsibility of each activity in administration, operation and sales needs to be definitely set. Nearly all industrial sales organisations will have to be rebuilt.

In many cases new sales policies must be created and the many competitive conditions that arise will need to be analysed carefully. Based on defined organisation measures, a graphic diagram, known as an "organisation chart", will do much to eliminate uncertainty, depict the flow of authority that eliminated overlapping responsibilities and cross-purposes, and will guide the company to direct, streamlined action in the attainment of post-war objectives.

2. Eliminate Waste Through Cost Finding

SUBSTANTIAL wastes remain hidden in many plants because of the absence of accurate cost finding. When there is no basis for ascertaining where costs are excessive and no mechanics for keeping them under constant observation, there is not adequate means of controlling costs, and fixing the blame for those which are excessive.

A modern cost-finding system is tremendously important at any time—the lack of it may mean business suicide in the post-war era.

3. Carefully Appraise Employees

PERSONNEL evaluation will become of increasing importance during the reconversion period, not only because of the anticipated

Ten Tenets

for Better Business

change in number of workers but also because of new products, requiring new jobs with new skills, and the return of service men to their old plant jobs.

Case histories of all workers will be necessary. A sound programme of employment - management relations needs to be built

up. Basic improvements and modern scientific procedures must be carefully studied and incorporated into the personnel programme.

4. Establish a Complete Expense Control

LACK of adequate expense control results in "half-baked" decisions based on guesses, snap judgments, or blind following of precedent. These superficial decisions are often responsible for grievous wastes.

How can management hope to plan intelligently without knowing what constitutes a reasonable potential and without establishing a measure of accomplishment? Complete expense control substitutes certainty for uncertainty. It provides a basis for monthly and quarterly reports by which the executive can compare estimated and actual performance pertaining to production, labour, expense, plant, and equipment. Such reports aim directly at the main target of post-war planning—cost reduction.

5. Install a Systematic Production Control

WITH the first four tenets in operation, management is in a position to consider production control, which is a major industrial device for reducing waste in actual production time.

Standardisation of jobs and methods is basic in establishing cost reduction. The preliminary approach analyses and records over-all arrangements, processes, equipment, and material handling from the view point of worker efficiency. All of these elements, including production planning and scheduling, must be co-ordinated into harmonious productivity.

6. Make an Efficient Plant Layout

RECONVERSION will unquestionably require many changes in plant layout. In some cases buildings and other property will have to be abandoned and floor space for manufacturing will be much reduced. In other cases, space and the entire plant layout must be expanded.

In either case, the logical sequence of processes should be maintained the grouping of

ROUND TABLE

machines kept natural and convenient, and the flow of materials so regulated as to economise time, distance, and cost.

Large savings in production time and in handling costs can be realised through more efficient plant layouts—co-ordinated with operations and products.

7. Adopt a Scientific Wage Incentive Plan

AMONG the most vital and farsighted procedures in management is job analysis—breaking down jobs into their various elements—job standardisation, performance standards, and job pricing. Not only do these junctions possess important values in themselves, but they form the basis for wage incentives.

More than 50 per cent of all manufacturers now use some form of wage incentives, but many of these plans are antiquated and need revision. Incentives should be extended to include indirect labour as well as direct, and should also be applied to supervisory and key personnel as a reward for holding down expenses.

8. Seek Constant Improvement of all Methods

SCIENTIFIC business principles are permanent, but methods may be changed or discarded. The advent of such new machinery, the manufacture of entirely new products, the introduction of different industrial objectives, will bring about many transformations.

In the post-war period the need for constantly improving methods in various mechanical aids, and in employee-management relations, will be imperative. Great stress will be placed upon better ways of handling and stimulating unit costs. Also, improved methods in materials handling achieve substantial savings in labour and in smoother flow of production.

9. Set Up and Maintain High Standards of Quality

ONE of the first matters to be considered by the manufacturer is waste due to rejects. This waste should be controlled by setting up quality standards and typing in responsibility for quality with the functional chart. Control of quality can be maintained through a system of complete and scientific inspection.

The George S. May Company's chief, world's leading business engineer, gives ten golden rules for success. To use them now ensures a strategic position on the post-war market front

10. Make Sure of Your Markets

IN the scramble for markets after the war, the greatest sales responsibility will be selecting and acquiring markets and charting sales and distribution. To this end it is absolutely imperative that a very careful

and comprehensive analysis be made of both present and potential markets. Old markets may have migrated. New markets will have to be built up. Domestic and foreign competition will need to be faced.

Only by market analysis can business avoid the tremendous waste of money and effort that would be caused by advertising and sales effort expanded in wrong directions. I firmly believe that if business and industry will embrace these ten tenets of good business, they will reach new heights of activity and service. The principles implied have all been tried and thoroughly tested. They are based on the axiom: to plan soundly you must use *facts*, not guesses.

11. Executive Deadwood

IHAD lunch the other day with Mr. Lewis C. Ord, whose book "Secrets of Industry" created such a stir about a year ago. Naturally conversation turned on the absorbing topic of production per man hour, the difference between American and British technique, with the revelation that Mr. Ord is at present hard at work on a successor to his last book.

"Administration is not as streamlined in this country as it is in the States," said Mr. Ord. "Social influences exert an undue pressure and there is a deal too much log-rolling. Another cause of the unfortunate P.M.H. position is that accountants, financial interests and theorists have too big a say in the actual job of production. Any way, they direct as to what should or should not be manufactured without considering too deeply the technicalities involved."

That the top men on the other side of the Atlantic can get down to practicalities was brought home to the directors of one British concern who had bought a special machine tool from an American supplier. On a visit to this country, the President of the American concern learned that his British customer was dissatisfied with the performance of his product. He went down to the factory, had a look at the machine, saw how it was being used, took off his jacket and immediately set to to correct the fault and give sound technical advice on its further use and maintenance.

Here is the difference. When you have men at the top, possessing the definite know-how, it is impossible for inefficiency to reign very long.

J.F.M.

Transferred Files— How to Take Care of Them

As the New Year opens, there is the annual problem of, "What'll we do with all the stuff from our files"?

Here are common-sense, proved suggestions on how to cope with the transfer problem, without piling up future trouble when somebody wants a five-year-old paper

TRANSFERRING old material to storage in order to start new files certainly clears the decks for action above-stairs, and a programme of destroying obsolete papers should be standard practice in every office. Conversion from war to peace industry means that this is being accomplished on a larger scale than usual.

It is presumed that only important papers are sent to transfer file. If the material is worth saving, it is worth taking time to put it in good order and so marking it that it can be found in the future. Most people intend to do just this, but lacking definite instructions from a central source, their ideas of adequate labeling vary.

While the name of the persons authorising the transfer should definitely appear on the label, transfer boxes labelled "Miss Harris' Files," "Prior's Records," or "F. Brown, Per-

sonal," are open to speculation years hence when a frantic search for some particular record raises the suspicion that Harris, Prior or Brown had anything to do with the matter. Many an hour has been spent by a conscientious file clerk on just such a search, and all the while her superior fumes helplessly at his desk.

Small Files the Headache

Alphabetically, numerical or chronological files present no problem in storing or looking up. It is the small files covering specific subjects that cause trouble. The file arrangements are usually to subject, or in what the owners term "logical" order. Listing the folder titles and putting a copy of this list inside each box will save time. Just the fact that the list must be typed out will mean a more orderly arrangement, and the request for the list will often reduce the volume of material to be stored.

Uniform box labels, providing space for all the desired information, clear up misunderstandings. Couple this uniform label with a set of written instructions for transferring, and some of your problems are behind you.

Transferred files are usually stored in out-of-the-way corners. Most companies do not provide first-class lighting for files that are consulted but rarely. File cases are piled to the ceiling to conserve space. This troublesome three-some means endless time can be spent reading labels with the aid of a torch, or an extension light, and often a box will be passed up in sheer nervous haste.

Files							
RECORD OF TRANSFER TO STORAGE							
Box no	Date	Dept	Title	Location		Disposal	
				Buildg	Sec	Date	File
2053 to 2054	8-13-45	Cost	Time Tickets - June 1945	7	56		
2055 to 2056	8-13-45	Payroll	Clock Cards - June 24, 1945 to July 1, 1945	7	42		
2047	8-13-45	Payroll	Payroll Distribution-Salary-Jan 21, 1945 to July 8, 1945 (See list in box)	7	36		
2048	8-14-45	Tool	Tool Repair Tickets - 1944 - Piled to Equipment Name	8	1		

Showing how to chart a bank of transfer files, so everybody who has to refer to them may find the material with minimum lost time. The above shows how to record the transfer of papers so no important material need be buried beyond finding

A sketch, as shown in the illustration, of each section of the storage room, with the box label information inserted at transfer time, will save many times the hours spent in making it. Files can be located on the sketch before they are moved, and there will be no shifting afterwards to make things fit.

Another important item much overlooked in transferring is keeping a record of the material transferred. Just as you number your invoices and purchase orders to prevent loss and misuse, number each box and post the label information to a chronological record.

It helps keep boxes in file order and the record gives a strict accounting of every box in

storage. It does away with dependence on the memory of the individual. Another good feature of such a record is that when box labels are lost or mutilated, a new label can be made up from the original source and not from guesswork. Stenciling the numbers on the boxes will help to locate them in dark corners.

It is well recognised that all these little things are frills which take a certain amount of time, and cost money, but once the records are organised and operating, balance the time spent keeping them against the seemingly endless hours that are spent searching old files, and the scales will tip in favour of records every time.

Section 17 - Transfer Room 31 Tiers - 8 High

3	4	5	6	7	8	9	10	11	12
Dept.	Pur Dept P.O. 1940	Pur Dept P.O. 1941	Pur Dept P.O. 1942	Pur Dept P.O. 1942	Pur Dept P.O. 1942	Pur Dept DPC P.O. 1942	Pur Dept P.O. 1943	Pur Dept P.O. 1943	Pur Dept P.O. 1943
	T-365 K-289	HO-173 E-208	A-10 A-16	H-146 IJ-172	SE-332 ST-357	A-1 to A-3229	D - 17	N - 100	STOB - TT
System	LB System	LB System	LB System	LB System	LB System	Alphabetic	Alphabetic	Alphabetic	Alphabetic
						Pur Dept Navy P.O. 1942			
4	WL-290 XYZ-409	K-209 M-232	A-17 B-23	LD-173 K-187	ST-358 W-377	A - 2	E - FR	MOV - NAB	TU - V
								NAC - NZ	W - WEL
								O - P&S	WEM--WN
								PAT - RAK	WO - XYZ
								RAL - SAB	Pur Dept D.M.S 1943 4799 to (fill drawn with 1944)
								SAC - STAND	Pur Dept C.M.S 1943 2900 to (fill drawn



Five SHORT CUTS to Office Efficiency

Shorter Week—More Work

BBRITAIN'S largest non-ferrous organisation has worked out a formula for a non-official five-day office week. Officially, Saturday is worked, but an elastic arrangement allows every Saturday off for each member of the staff whose week's work is completed by Friday night.

To ensure the scheme working efficiently, the offices are closed to the public on Saturday, whilst only a necessary skeleton staff carries on.

The result is that the whole staff pull their weight, work energetically and have the week's detail and routine cleared by Friday night.

The office manager estimated that only one Saturday in four is a working day. There has been no salary cut, nor any increase in members of the staff. The "Saturday off" incentive, we are assured, has certainly raised actual production tempo.

Good Layout Means Better Output

YOU can have conscientious staff with all the latest office equipment and still fail to get the most from the executive side of your organisation.

Writing to us recently, an office manager reports that he discovered figure clerks and typists unconsciously put off their stroke by extraneous machine noises in their own and adjacent departments.

Soundproof insulation was tried and estimated increase in efficiency, 10 to 20 per cent, has resulted.

Most noticeable improvements were observed in the late afternoon. Checkup: is there too much noise in your office?

Records in the Right Place

AN office manager recently watched two clerks carrying card drawers from the cabinets to their desks and back again. Sometimes the wrong files were brought, sometimes only two or three cards were looked up, after as much as a minute spent in transporting between desk and filing cabinet.

As a result, the manager divided the card cabinet, allowing each clerk a definite part of the alphabet.

The card clerks were then given special tables, lower than standard table height and the cabinet set on the table immediately at the clerks elbow. There was no more running around; all the clerk had to do was take any

lay it on the table in front of her, designed at a convenient working height.

You see, it is not enough to have the equipment; there are many special adaptations in the use of equipment which increase its value.

Good Stenography

A NOVEL method of testing typists is occasionally used by one office manager. When he decides to make a test, he summons the entire force of shorthand-typists into a special office.

They are given fresh notebooks and the office manager dictates a certain quantity of material from a trade paper. When they have taken this down in shorthand, he collects and keeps the notebooks.

Several days are allowed to pass so that the shorthand grows "cold." Then, as and when work permits, each girl is set to work copying from her original shorthand notes.

She is timed on the job and is placed on the basis of the number of errors she makes. By this plan, he estimates the value of the work in the typists' pool. It also acts as an incentive to efficient shorthand transcription and typing.

War's Over in Office Too

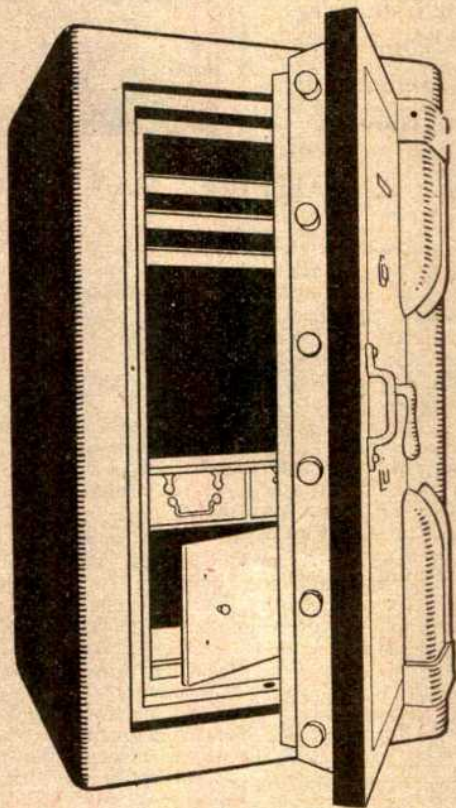
HOW many routines or systems were installed to safeguard some wartime schedule or activity? Are they still needed? How many reports were developed to fill some wartime need, to comply with some Army, Navy, or Air Force requirement? Have these been dismantled or abandoned or revised to fit current conditions?

There is another side to the story also—that is, how many peace time office activities were abandoned during the war? Are the mailing lists the same to-day as in September, 1939? Are customer records up-to-date? How about sales analysis records? If the bulk of your output has been going to one customer for four and a half years, your civilian customer records are probably just about worthless to-day.

When these questions are answered, there may come a demand for more space from one department, for less space from others, for changes in routines and procedures that demand changes in office lay-outs.

One company drew up a floor plan, outlining in red all space occupied by people concerned with jobs which were possibly obsolete as soon as war contracts were wound up. This plan

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Report on Office Switchover

*This concluding article gives
the Four Final Steps of a
Detailed Programme of
Office Reconversion*

By AN OFFICE MANAGER



IN one office, where war contracts held priority over everything, every purchase order was assigned to one of a group of expeditors. This meant an extra copy of every purchase order had to be made for the expediter to whom it was assigned for follow up. In a few months now this routine can be entirely abandoned. The company has already made plans to simplify the purchasing system accordingly. In another office several people and considerable equipment were tied up in producing tags, labels, pin tickets and other devices for identifying War Office contract material and parts, according to Army needs.

Back on civilian production the company found some of the principles and methods worked out for the Army were valuable in civilian production. But the whole department has been simplified and streamlined, and considerable space and equipment released.

Every report, every compilation of statistical information, every extra copy of every paper, in fact every routine added for war work must be examined, analysed and studied to reach the proper decision as to whether it will be discontinued, revised, or maintained "as is."

Do not wait until some one asks why some wartime report is being continued. Take the initiative and get authority to discontinue or simplify every office job that developed from war work.

Modernise Machines and Equipment

Recently, a group of nearly 200 calculating machines was examined by one of the executives of the company. It was found the machines were purchased in 1927. They have been wholly satisfactory.

Further study reveals that the manufacturer of these machines had modernised them and has included several improvements since 1927. New machines were purchased. Soon after

up so much that an inquiry was made to see if work was decreasing.

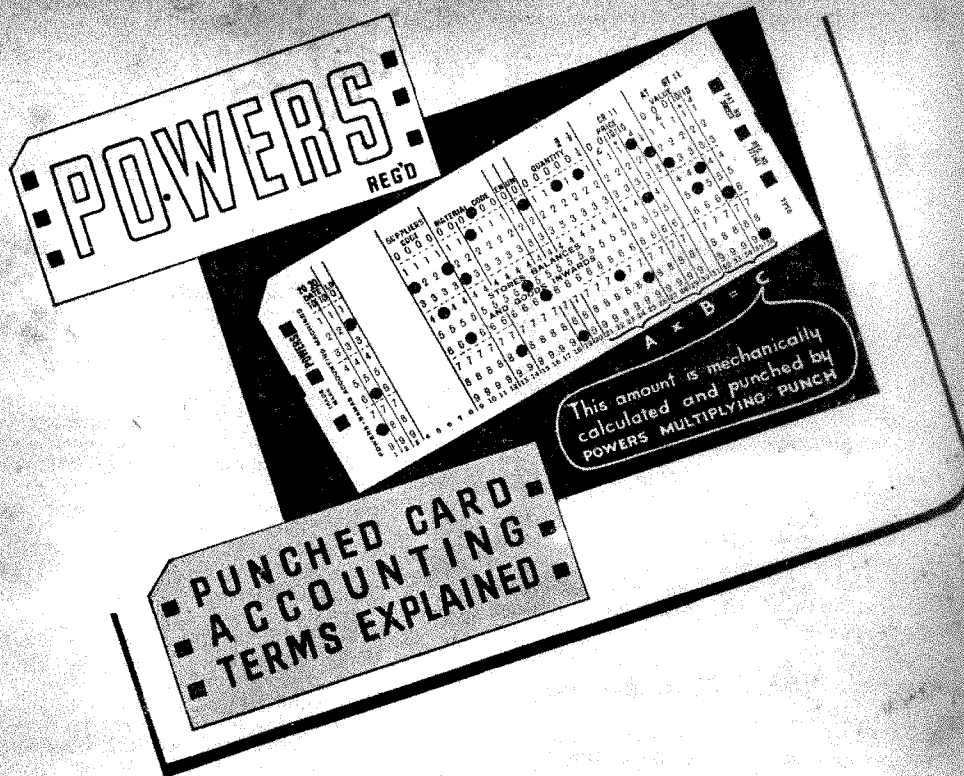
It developed that volume was increasing, but that the same group of workers were turning out so much more work that it seemed as if less were being handled. Estimates reveal that these new machines will pay for themselves in about two years.

Of course everyone knows that every typewriter in business is probably worn to the point where a new one will be cheaper. Practically every business house plans to buy new typewriters.

But how about adding machines, calculating machines, billing machines? In one office which recently installed one new billing machine in a department where there were two, it was planned to keep the newer of two machines and replace it about a year later. When the new machine was put into operation, it was quickly apparent that one operator and one machine could do the work formerly done by two machines and two operators. Actually the second machine and second operator had not been engaged in billing for full time, but there was more work than one machine and one operator could do. With the new, modernised machine, one operator does the entire job.

Best managed offices set a replacement date on every machine when it is bought. For example, in these offices, certain machines are automatically traded in on third birthdays, and so on. Some such record as this ought to be inaugurated to-day, with a schedule of replacements so obsolescence that is costing the most money will be the first to be corrected. Otherwise the operator or supervisor or departmental manager who complains most, or screams the loudest, gets new machines, regardless of need. Care should be taken to determine when improved models make it wise to replace machines, even though they are not worn out. Thus it may be wise to examine every machine to determine:

(1) Whether machine is worn past economic



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- (2) whether new models available with greater speed or other improvements make it economical to replace, even though the machine is not worn.

Do not stop with checking only machines. How about chairs, desks, tables, files, storage cabinets, bookcases?

Improve Office Housekeeping

Large piles of correspondence stacked on top of a row of filing cabinets. Window sills in the purchasing agent's office used for stacks of catalogues; men's coats hung on the backs of chairs; piles of magazines and business papers on tables without order or neatness, instead of on shelves in the office library; desks piled high with papers; rolled drawings, blueprints, exhibits, charts, etc., standing in corners of offices; books, supplies, catalogues, advertising material stacked on tops of bookcases, instead of in bookcases or files—these are but a few of the commonest evidences of poor office housekeeping. The point to remember is that such housekeeping is expensive. It hampers proper cleaning. Materials collect dust, fade, become worn and dog-eared when improperly filed or put away. Supplies are wasted, time is lost looking for books, drawings and other reference material.

But perhaps more important than anything else is the attitude such housekeeping engenders, the effect on visitors, the poor morale it fosters. Provide the purchasing agent with the shelves or bookcases he needs to maintain his catalogues. Show him how to index and arrange them properly. Clean up a corner that has been allowed to become a "catch-all"; properly stack, file or throw away an accumulation of assorted junk on some tables in a prominent place in an office, and see how such little improvements become contagious and start others rearranging, cleaning, straightening, filing.

With more help available, get a man to wax and polish every office desk. Most office desks have amazingly dirty tops. Everybody will appreciate a clean desk top. Encourage some one person to clean out the corners of his office, get the junk off the window sills, off table and

induce others to follow his lead. Work will improve, morale will perk up, grievances will decrease and there will be less lost time in an office that insists upon good housekeeping.

Speed Service to Top Management

Purposely last, not because it is of least importance but because it ranks high in importance is this suggestion to speed service to top management. How late in the month does management get a consolidated report? How quickly does top management know the condition of sales, collections of production, as compared with last week, last month, or last year?

How long does it take management to be informed about cost figures? Top management cannot see every order, cannot check every expense account, cannot see every complaint, cannot inspect every rejected product or returned shipments. But top management needs to be informed of all these things, and given recaps, totals, summaries in time to do something about things that need correction.

The office which keeps top management waiting until statistics, reports, figures are ancient history is, to all intent and purpose, being run by department, not by top management. One of the strongest demands which top management will make from here on is for speed in consolidating and recapping all the salient facts about the business. The office executive who anticipates this need, raises himself in top management's estimation.

Business Appointments

MR. B. Hallows Garside, A.M.I.E.E., has been appointed managing director of the Britannic Electric Cable and Construction Co. Ltd., and of Hopkinson Motors and Electric Co. Ltd. The two companies are members of the Philco group. The appointments took effect from last month.

Mr. Garside joins the Britannic Electric Cable and Construction Co. Ltd., and Hopkinson Motors and Electric Co. Ltd., from Crompton Parkinson Ltd. For the past three years, he has been general manager of Crompton Parkinson Ltd., having served with that company for 18 years.

* * *

MR. N. V. Kipping has resigned from the Board of Trade in order to take up his appointment as Director-General of the Federation of British Industries. Mr. G. Calder will succeed him in charge of the Division responsible for the Regional Organisation of the Board of Trade, and for the Regional Boards' Organi-



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Let Films Tell Your Story

"EXPORT or die"—the words are on everyone's lips to-day. For once the universal catch-phrase is not a fallacy. We must sell our goods abroad in order to obtain the currency to pay for sorely needed imports. Britain is like a casualty crying out for a transfusion of blood to relieve the shock of war, and bring sustenance to the vital parts of her exhausted body. The life-blood of trade is the need. Here we discuss one means of aiding its circulation—propaganda through documentary and industrial films.

Films of this type, which were gaining ground in 1939, developed enormously during the war. They were used extensively in training Service personnel in battle practice, and the use of every conceivable type of armament, and in teaching new-comers to industry the workings of their products. Clearly such productions could be used for training salesmen and apprentices, but that is not our concern at this juncture. We are interested in films as a direct influence on foreigners to buy British.

Prestige Through Documentaries

Let us first deal with the documentaries. The development of these films during the war is well known. Few of us will forget what "Target for Tonight" did for Bomber Command, or what "Desert Victory" did for the Eighth Army. Such "prestige" films, as they are known, won universal admiration for our fighting men and earned high praise in their own right. The lessons learned in their production have not been lost on British producers, who are even now putting over to our friends overseas the more peaceful aspects of British life.

Industry features largely in their enterprises. Typical examples are those productions "Steel" and "Colour in Clay", which were made for the British Council by the Film Producers Guild and Gaumont British Instructional Ltd. respectively. Since 1940 the Council has made very many films of this kind, many of them in 10 different languages. Subjects covered included the British glass industry, British ship-building, the cable industry, the pottery industry, the woollen trade and the Lancashire cotton trade. The value of these productions in building up regard for British industry abroad will be apparent to everyone. Moreover, they cover the awkward period of reconversion. While manufacturers are designing and re-tooling, foreigners are being impressed with the efficiency of British industry as a whole.

It is when they are far advanced in recon-

passed and flow production is beginning—that manufacturers come directly into the picture, by means of the so-called "house" films. Many firms are already at this stage. Among them are manufacturers of steel, motor cars, heavy engineering equipment, pre-fabricated houses, china, medical supplies, razors, household goods, aircraft, aircraft accessories, machine-shop road making and mining equipment. Typical of the firms and associations who made films during 1945 are the Iron and Steel Federation, Burroughs Wellcome, Simmonds Aeraccessories, Gillette Industry Ltd., Firth-Vickers Ltd., Firth & John Brown Ltd., Portacord Ltd., Babcock and Wilcox Ltd., the Securities Ltd., etc.

The scope of these "house" films varies considerably. In some cases the history of a firm is told, in others the whole of the footage is devoted to a description of one particular production process. You can show simply the finished article and demonstrate its working, performance or utility. Or you can give news of forthcoming lines, and boost the firm's after-sales service. Animated diagrams and cartoons may be used, and it is hoped that the restrictions on colour will soon be lifted.

In this connection it is interesting to note that before long the new Agfa Negative-Positive colour system will be available for industrial films, in addition to the Technicolor already used in 35 mm. films and the Kodachrome adopted in 16 mm. work. Dr. S. L. Weber, of Furneaux-Weber Ltd., will act as technical adviser on the new process, when the film stock is available.



First rate commercial production. "High Quality Steel." A still from the film showing

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That is the aim of every Nuffield engineer: to make for you a product you can trust. For six years of war men's lives depended on the sound engineering which went into the manufacture of all the tens of thousands of tanks, gun-carriers, aircraft and Army vehicles produced for the Services by the factories of the NUFFIELD ORGANISATION.

To-day, your new car is being built in those factories. Before it is allowed on the road it will have passed every test known to modern motor-car manufacture.

The victorious Fighting Services trusted Nuffield products: so can you.



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The initial cost of making a black and white industrial film is fairly heavy. Figures quoted by Gaumont-British and the Film Producers Guild indicate that films of the kind we have been discussing, which last between 20 minutes and an hour, require an outlay of anything between £3,000 and £30,000, depending on the character and location of the job. Nevertheless it should be remembered that a film, once made, is a permanent, or at least a semi-permanent asset. It can be used over and over again, and copies can be made very cheaply. A reel of 16 mm. film can be taken from a thousand feet of 35 mm. original for as little as £3 10s. Moreover it sometimes happens that an industrial film is so dramatic, and so entertaining that it can be sold for distribution in ordinary cinemas.

This raises the whole question of distribution. When an industrialist has his film in the can, there are a number of alternatives before him. He can distribute it himself, through his agents at home or overseas. He can use the distributing system of the company which made the film. If that does not meet his requirements he can go to another distributing company altogether. What he does will depend on the type of film he has made. Some industrial films are so technical that they can only be shown to experts. Others are more generally understandable, and can be shown with good effect to lay audiences.

Distribution Cared For

The Film Producers Guild offer distribution facilities at home, but not overseas. They have a mobile cinema service possessing over 100 units each of which is equipped with 16 mm. sound on film projectors, screens of various sizes, etc., and each of which is handled by an experienced operator. At the back of these units is a staff which finds audiences among the general public, in sales conventions, trade exhibitions, clubs, and the like, and arranges for halls and publicity. Before the war the service could arrange up to 35,000 shows per annum in Great Britain and Northern Ireland, and reach 14,000,000 people. Post-war statistics are not yet available.

Gaumont-British offer the facilities of the Odeon Gaumont-British circuit and Eagle-Lion, General Film Distributors and associated distributing organisations, which between them form a world wide network. Use can also be made of the Gaumont-British world wide 16 mm. distribution service, as a result of which 16 mm. copies of industrial films can be made immediately available in all territories.

The industrialist can thus have a new production distributed throughout the world by the 16 millimetre library. In addition he can draw upon the Library for, say, a general "prestige" film to introduce the showing of his "house" film. G.B. Agents are also in a position to provide projectors on sale or hire on the spot, which can be carried in ordinary cars and used either by the industrialist's agent or the G.B. Agents themselves.

Another move by Mr. Rank, which is important in this connection is the arrangement by

which the Companies he controls, in addition to their present world wide activities will manufacture a complete range of Bell and Howell products for distribution in England, the Dominions, the Colonies and many European countries.

With the advantages listed in this article, and others besides, it is not surprising that the Board of Trade have released material for use in export-aiding films, in addition to what they have allowed for documentaries with no direct advertising slant. For its part, the film industry is fully alive to the potentialities of industrial productions in marketing and export technique. Other firms besides those already mentioned are developing this side of their work. Pathe, for example, have an industrial department for which all their cameramen are available, so that manufacturers benefit from all the skill and experience which go into the making of feature films which audiences pay to see. There are also numerous smaller concerns which turn out first-rate productions.

It only remains for trade and industrial federations and associations to co-operate with producers in making documentaries, and for individual members of the associations and federations to have house films made as a follow-up, for a much needed fillip to be given to British export.

Orders Worth $\frac{1}{4}$ Million Sterling

Twenty-five thousand people, many from overseas, visited The Gauge & Tool Makers' Exhibition which closed in London on January 18th. Mr. Gilbert T. Beach tells me that so successful was the venture that the possibility of holding a similar exhibition each year is to be considered by the Association. Apart from enjoying the distinction of being the first national post-war industrial exhibition, home and export orders and enquiries received by the Exhibitors already exceed a total value of £250,000.

The Exhibition was opened by the Rt. Hon. John Wilmot, M.P., Minister of Supply, and the products on 90 stands included a first-class range of British manufactured gauges, measuring equipment, jigs, fixtures, special purpose machines, press tools, moulds and dies, and diamond tools and gauges.

Business Men Honoured

MR. C. B. Colston, M.C., D.C.M., chairman and managing director of Hoover Ltd., has been awarded the C.B.E. in the New Year Honours List for his work as Regional Controller under the Ministry of Production during the war.

* * *

Mr. G. W. P. "Tubby" Grant, assistant to Mr. William C. Pegley, of Vactric, the firm which has just sold £500,000 worth of vacuum cleaners to the U.S.A., has been made a C.B.E. in the New Years Honours List. For 15 years Mr. Grant was in the R.A.F., where he rose to the rank of Air Commodore. He became deputy director of Intelligence (Operational) at the Air Ministry in 1942, and director in 1944. He resigned his commission a short while ago to join Mr. Pegley's organisation.

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Exports Efforts Still Impeded

By Man-Power Shortage and Permit System

THE summary of figures for overseas trade for November makes grim reading. Compared with those for the preceding month they show a sharp reaction in exports coupled with a jump in imports and thus a big rise in the visible adverse balance of trade. The value of exports of United Kingdom goods was £29,900,000, compared with £42,800,000 in October and £29,800,000 in November, 1944. The value of imports to £90,200,000 compared with £71,400,000 in the preceding month and £121,400,000 in the corresponding month last year.

Although it is pointed out that trade was affected by the dock strike, these figures simply are not good enough. I do not think the fault lies with industrialists. Those who have been lucky in their dealings with the Board of Trade, the Department of Overseas Trade, and the Ministry of Labour have, on the whole, made a good job of reconversion, and are now turning out goods in large quantities. It comes back to the Government, therefore. One cannot help feeling that in their desire to achieve a planned economy for the country as a whole they have lost that sense of urgency in dealing with manpower and licensing problems which is essential at this time. As Cecil Chisholm asked last month "What about blanket or bulk licensing?"

SOME downright blunders have been made. Elsewhere in this issue the chairman of a firm which manufactures the heavier units of chemical, petroleum, iron and steelworks and soap manufacturing plant bemoans the withdrawal from his employment of a considerable number of young trainees and young fully trained men. This policy, he says, is bound to have a serious effect upon the company's productive capacity and, if pursued nationally, would have most disastrous repercussions. One hopes the situation has altered since the time of which he was speaking. The replacement, renewal, or major repair of the heavier units of production is one of the outstanding problems of reconversion. Nothing must obstruct its solution.

THEN there are the pin-pricks—pin-pricks, that is to say, in the whole body of overseas trade, but sharp jabs to the people concerned. The other day I had a letter from the managing director of a firm of manufacturers of storage equipment, drying cabinets and oil cleaning machines. This is what he said:

"In August last we received an order for several thousands of pounds worth of our

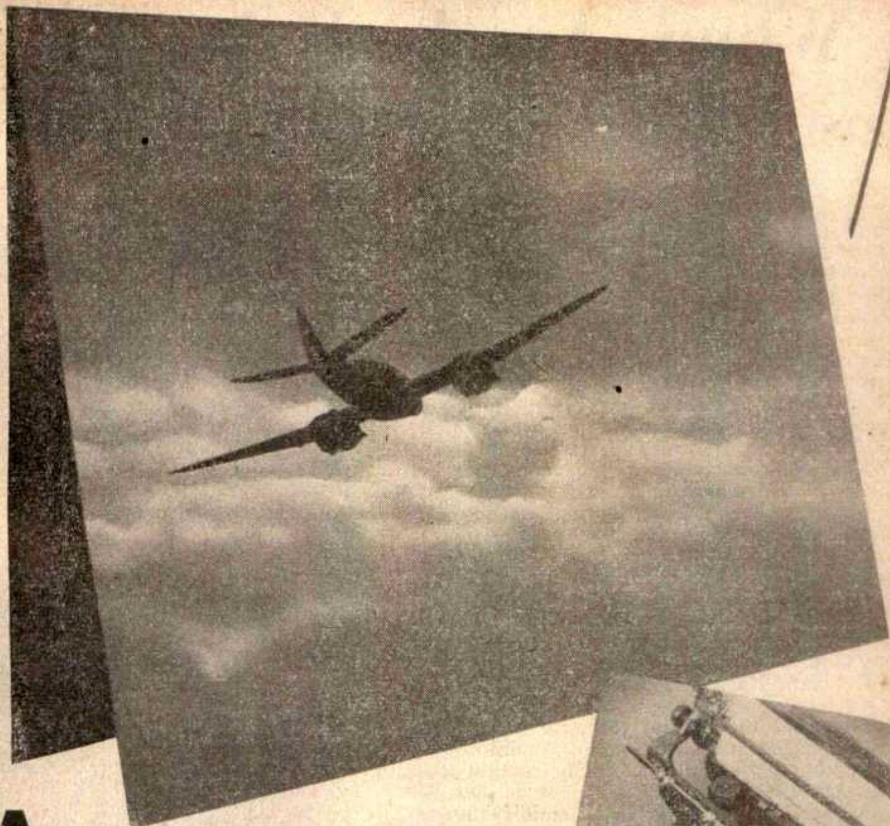
mobile storage equipment. The order was placed on the usual basis of cash against documents London. Subsequently the Turkish Trade Minister made a decree which prohibited irrevocable letters of credit, *except in respect of trade with the U.S.A.* (my italics), and consequently British goods supplied to Turkey could only be paid for in Istanbul.

"To make matters worse, the Trade Minister has since withdrawn steel furniture from the list of goods allowed to be imported, which rules our products, with the exception of oil cleaning machines, out of the question for the time being. In the writer's opinion, American interests have pulled a fast one . . ."

Fortunately, I am able to say that the prohibition on irrevocable credits in London, as instanced by my correspondent, is probably being removed. Full particulars have not yet been received, but the Board of Trade hope to make an announcement in the Journal shortly. On the point about the list of goods allowed to be imported, there is only cold comfort; the prohibitions apply to all countries exporting to Turkey.

YET there are rays of hope and encouragement in the dark clouds which at present hang over 1946. For the first time Britain is selling to America, original home of the gadgets, hundreds of thousands of vacuum cleaners. The first order, involving more than £500,000, has been negotiated by Mr. William Pegley, managing director of Vactric Ltd., one of Britain's largest manufacturers of domestic electric appliances. This amount will be substantially increased by further orders which will bring the total delivery of cleaners to 250,000. Moreover, Mr. Pegley is not neglecting the Empire. He is continuing his world business trip by way of Australia, New Zealand and, he hopes, India. He anticipates bringing back further large orders for British domestic electric appliances.

Without in any way deprecating their achievement, Vactric may be cited as one of those firms which have been fortunate in their dealings with the Board of Trade. Their factory in Scotland is one of the largest to be built under the B.O.T. spacing out industries scheme, and the fact that it is located in the formerly depressed area of Airdrie, Lanarkshire, means that labour is available. Even now, employment stands above the scheduled figure of 1,800, and ultimately it will exceed 3,000. Machinery is the only obstacle to increased employment—another point in confirmation of my earlier remarks.

On target—on time

AT brief intervals in flight, the navigator fixes the position of his aircraft, plots the track-made-good and predicts his forward position for a chosen time ahead. On this basis of fact and logical deduction he calculates the course to steer, which, despite winds of any velocity, will bring him to his target.

Moving onward against the "flak" of competition and "crabbing" always against the pressure of changing trends and controls, modern industry, too, has produced an up-to-date "navigational" technique... a new method of **full** accounting, made possible by **National Accounting Machines**.

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It Pays the Textile Industries When Air Is Balanced Cost Falls, Products Improve

By L. G. W. GOSDEN

NOT a single book, but volumes, could be written on the need for the control of humidity in this industry alone, covering as it does, wool, cotton, silk, rayon, flax, jute and hemp, etc.

Fortunately, there is in the trade already an immense knowledge of the advantages, plant of various types having been in use for upwards of 50 years. In fact, the spinning and weaving end of this business showed considerable foresight in deliberately choosing the moist air conditions of the Lancashire and Yorkshire valleys for its mills, thereby securing the best "weather" conditions for the manufacture of its material.

Nowadays, of course, these "natural" conditions are completely inadequate to cope with modern buildings, modern machinery and the greatly increased speed of production.

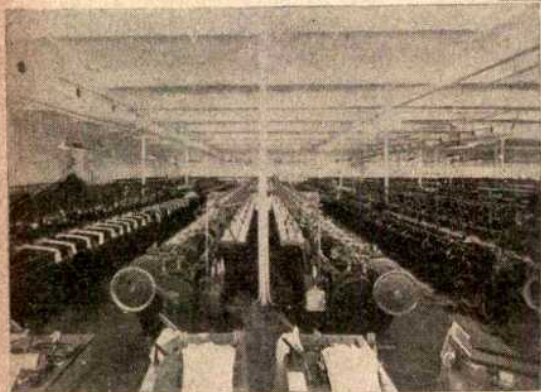
Briefly, the spinning industry's greatest trouble is "static," which is caused by the friction of production, combined with a dry atmosphere drying out the natural moisture of the material, and being in a fibrous or dry condition, a small discharge of static electricity continually takes place, causing endless annoyance and minimising production. Controlled humidifying

plant maintains the natural moisture content in the material, and in this condition eliminates static entirely.

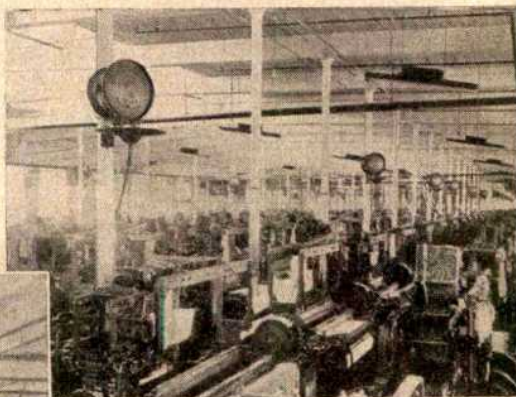
In this perfect natural condition, the resultant yarn is stronger, giving less breakages and continuous production with opportunities of even increasing production.

Furthermore, a dry yarn tends to become brittle, and "grow whiskers" which break away in dust. In the trade, this is termed "fly," and in addition to this representing a loss of actual material, it is a source of annoyance in cleaning, maintenance and breakdown of machinery.

Please turn to page 84

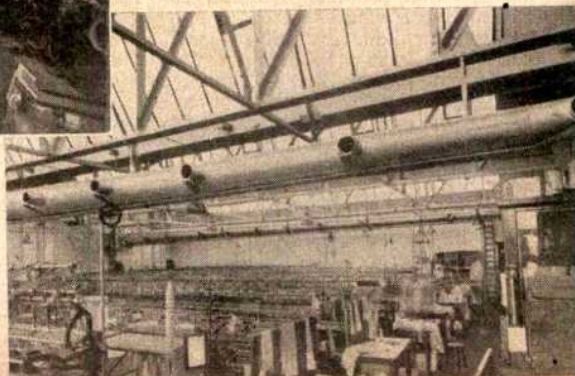


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CONDENSATION

can be prevented!

By A. H. T. BRODERICK

CONDENSATION can be the cause of much trouble and inconvenience, particularly in industrial buildings. The dripping of moisture from the roofs and walls, even for a short time, can easily damage machinery or stock, and short circuit electrical equipment, causing costly stoppages and repairs. The structure and decoration also suffers. Yet the enormous loss caused every year by condensation can be easily prevented by the proper use of structural insulation.

The connection between condensation and structural insulation may not perhaps at first be apparent, but it will become obvious when the causes of condensation are fully considered. These causes can be most clearly demonstrated by simple domestic examples. Imagine a kettle boiling on the stove, and the steam coming into contact with two adjacent saucepans of identical material and finish, one of which is full of cold water, and the other full of boiling water. Water condenses on the surface of the cold saucepan, but not on the hot saucepan.

From this we conclude that the temperature of the surface has a close relation to the phenomenon of condensation. Under identical conditions condensation occurs on a surface of low temperature, but not on a similar surface of high temperature.

We have all breathed upon a window and seen a mist of condensation form on the pane. In this case we have not appreciably altered the temperature of the surface of the window pane, but we have created conditions in which condensation occurs, by bringing our moist breath in contact with the surface.

This shows that there is a relation between the amount of moisture in the atmosphere adjacent to any surface, and the formation of condensation on that surface.

The reason why condensation occurs will be appreciated when it is realised that the amount of moisture air can carry is relative to the temperature of the air.

Air at a temperature of 100° F. has a maximum capacity for water vapour of 19.7 grains per cu. ft., whilst the same volume of air at 30° F. is saturated with only 1.94 grains of water. Cooling 1 cu. ft. of saturated air at a temperature of 100° F. to 30° F. must therefore entail the precipitation of 17.76 grains of water.

It is obvious then, that if moisture-laden air is cooled beyond a certain point it will become incapable of retaining all its moisture, and a certain amount will be precipitated in the form of water, or condensation.

Relative Humidity and Dew Point

The amount of moisture contained in the atmosphere is usually described in terms of its "Relative Humidity," which is the ratio, expressed as a percentage, of the quantity of moisture actually contained in the air at a given temperature, to the quantity which would saturate it at that temperature.

The relative humidity of air at a given temperature may be 50 per cent, which indicates that it contains half as much moisture as would saturate it at that temperature. If this air is cooled it will ultimately reach a temperature at which the amount of moisture it contains will saturate it, and at this temperature condensation will commence.

This temperature is known as the "Dew-Point" of the atmosphere. When warm humid air in a building comes in contact with a surface having a temperature below the dew-point of the air, condensation must occur.

Condensation can therefore be prevented in a building by ensuring that the enclosing surfaces are at a temperature above the dew-point of the air within the building, or by removing some of the moisture content from the air by means of dehumidification.

In many instances a high relative humidity

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THE MINISTRY OF FUEL AND POWER in Fuel Efficiency Bulletin No.12, puts the case for the THERMAL INSULATION OF BUILDINGS in this nutshell:—

"Insulation may save more than half the fuel required to heat an uninsulated building and in the case of any new buildings which require to be provided with central heating or unit heaters, the cost of a heating installation may be reduced by more than the cost of providing insulation."

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that dehumidification is not permissible. In any case it entails operating costs as well as the capital cost of installing dehumidifying plant.

The alternative, namely, raising the temperature of the surface, can be obtained in one of two ways:

(a) by increasing the velocity of the air passing over the surface, or

(b) by reducing the rate of heat loss through the structure by means of structural insulation.

Increasing the velocity of warm air passing over a surface increases the amount of heat which will pass into that surface from the adjacent air, and thus increases the temperature of the surface. If the surface temperature is raised above the dew-point of the air, condensation will be eliminated.

This method is frequently used to prevent condensation on the inner surface of shop windows, but for general use it has the disadvantages that it helps to increase the heat loss from the building, and that any projection on walls or ceilings prevents an even distribution of the air stream.

How Insulation Works

The temperature at any point within a structure will be proportional to the ratio which the thermal resistance to that point bears to the total resistance. That is to say, if we have a

structure enclosing air at 70° F. when the outside air temperature is 30° F., the temperature at a point represented by half the resistance will be 50° F., and at one quarter of the resistance from the hot side, will be 60° F.

The temperature of the surface of the structure will therefore be in direct proportion to the ratio which the interior surface resistance bears to the total resistance.

Let us take as an example a concrete wall 5 in. thick, of which the thermal resistance is 1.71, made up as follows:

Material	Resistance.
Exterior surface	0.30
5-in. concrete	0.71
Interior surface	0.70
Total resistance	1.71

The resistance offered by the interior surface is $\frac{0.70}{1.71}$ of the total resistance. The temperature difference between the air on one side of the wall and the other being 40° F., the temperature drop to the interior surface will therefore be $\frac{0.70}{1.71} \times 40 = 16.3^\circ \text{F.}$ The interior air temperature being 70° F., the temperature of the wall surface will thus be 53.7° F.

By applying 4-in. insulating board to the interior of this wall as permanent shuttering, we increase the total resistance to 3.14, made up as follows:

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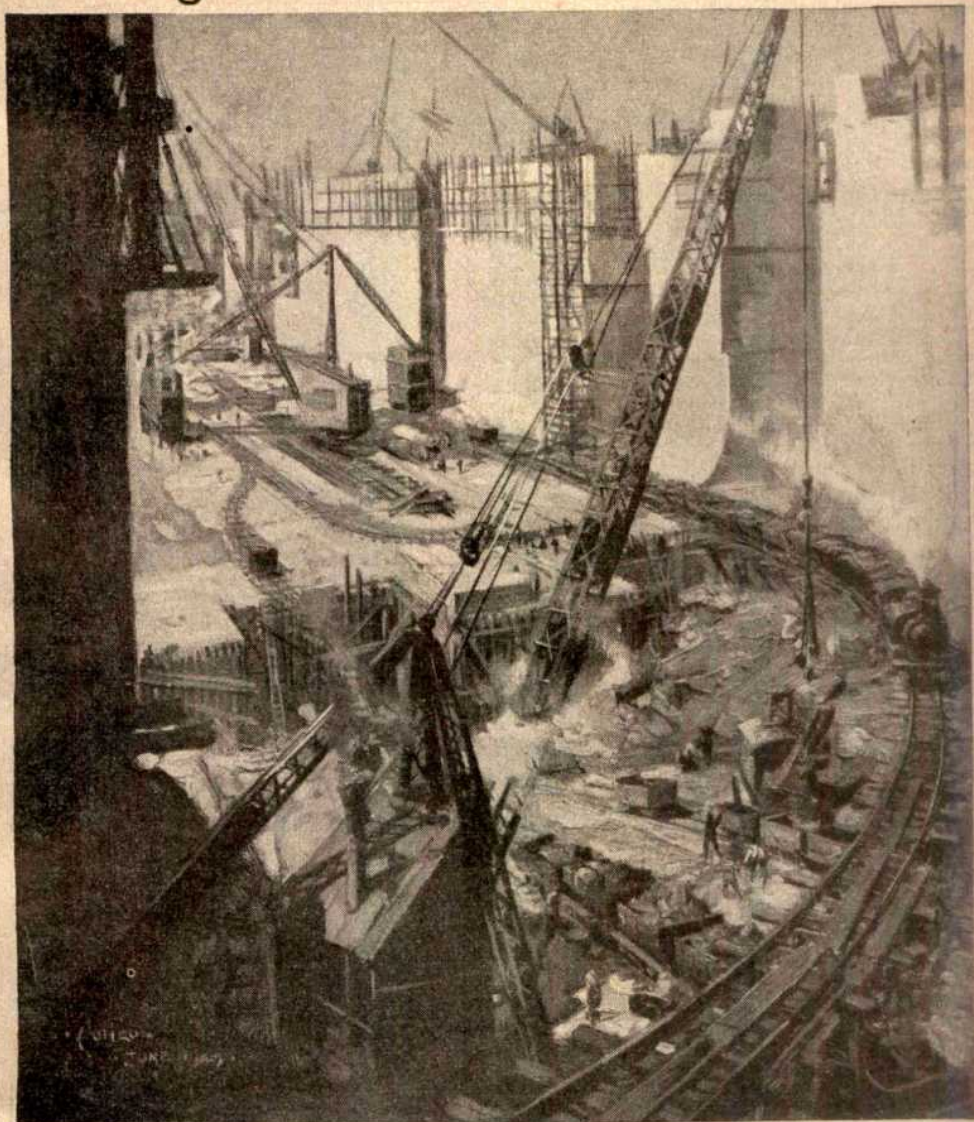
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Material	Resistance
Exterior surface	0.30
5-in. concrete	0.71
2-in. insulating board	1.43
Interior surface	0.70
Total resistance	3.14

The interior surface resistance now represents $\frac{3}{14}$ of the total resistance, and the temperature drop to the interior surface will now be $\frac{3}{14} \times 40 = 8.9^\circ \text{F.}$, and the temperature of the wall surface will be 61.1°F.

It will be obvious that the higher surface temperature secured by structural insulation will mean that the adjacent air can carry a far higher water content without precipitating part of that water content on the surface.

The diagram shows the temperature at various points through the structures mentioned, and illustrate the amount of surface temperature drop with and without insulation.

Incidentally, the diagram shows that where insulating board is used as permanent shuttering, the concrete itself is kept at a lower temperature, which means that less heat is expended in raising the temperature of the structure, and therefore the time lag between starting the heating plant and attaining the desired temperature within the building is reduced.

Warm Weather Condensation

Raising the temperature of the surface by

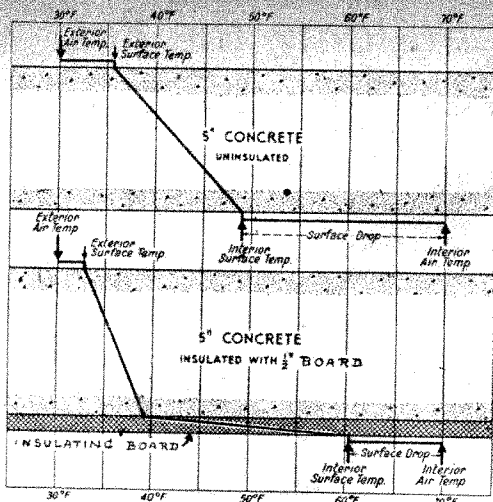


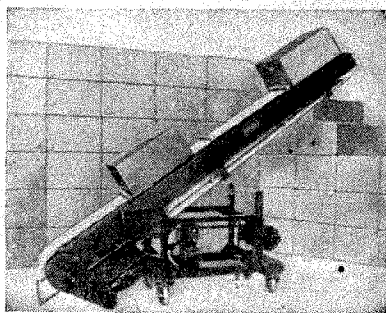
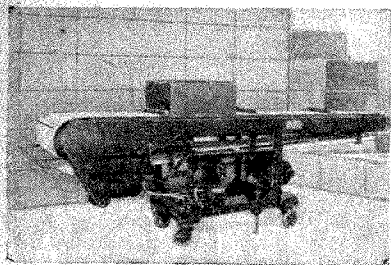
Diagram shows clearly the effect of insulation on surface

means of structural insulation in order to prevent condensation has the added advantage of reducing the heat loss from the building, thereby reducing heating plant and fuel costs, and this is the method usually adopted.

Condensation is generally mentally associated with low exterior temperatures, but this is not necessarily the case. Conditions sometimes

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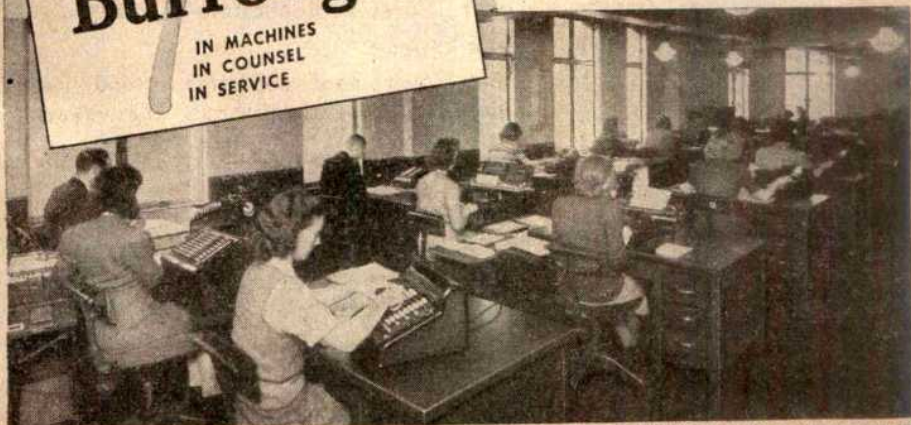
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occur during warm weather which conduce to the formation of condensation in buildings normally free from this trouble, and a discussion of these may be useful. At certain times of the year, particularly in the Spring and Autumn, we may experience a very warm morning after a period of cool days and nights.

A considerable rise in temperature occurring in a relatively short time means that there is a "lag" in the temperature of the structural portions of a building until they absorb enough heat to equalise their temperature with that of the air.

Concrete sections such as slabs, beams, etc., have a great capacity for heat and further a high transmission rate, so that the heat as it is absorbed is rapidly distributed within the beam without raising the surface temperature materially. As air of a higher temperature from outside enters the buildings and replaces the inside air, it rises to the ceiling, which is at or below the temperature of the replaced air.

Such condensation may only occur two or three times a year, but once is enough to disfigure the surface of a ceiling, or perhaps blister or flake off plaster, not to mention damage which may be caused by dripping.

These conditions may be prevented by applying to the interior surface of the structure a layer of insulation which will reduce the rate of heat transference to the interior of the structural members, with the consequence that the surface temperature will rise more quickly to that of the air.

It is safe to say that the problem of condensation is similar to most others, in that prevention is better and cheaper than cure, and further that in most instances where insulation is used as a safeguard against condensation it will also return substantial dividends in fuel saving.

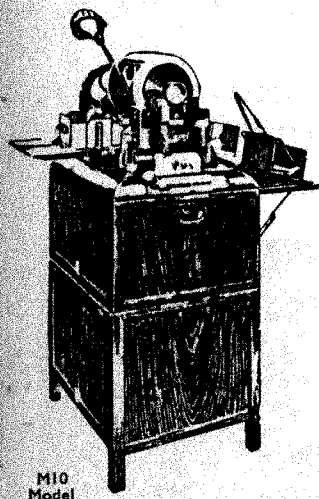
It Can be Eliminated

Should the incoming air be saturated, or nearly so, as is the case during rain storms, it is obvious that a very slight drop in the temperature of the air when it comes into contact with a cold structure will cause some of its moisture to be deposited in the form of condensation.

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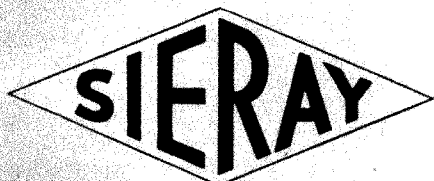
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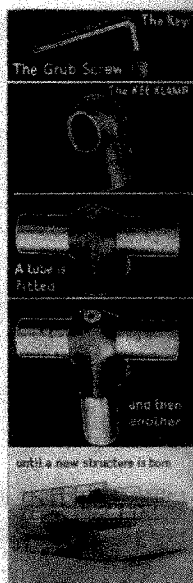
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WHEN AIR IS BALANCED

Continued from page 74

In a spinning mill, the air tends to be rather warm, due to the heat dissipated by high-powered machinery, lighting, etc. This heat load lowers the relative humidity of the air and attracts moisture from the yarn. High-speed machinery also means increased friction on the yarn, and these combine to dry out further, the natural moisture. Controlled humidifying plant is essential, not necessarily to put moisture into the yarn, but to ensure a correct moisture content in the air surrounding the yarn so that, as both air and yarn will be in balance, the natural moisture content in the yarn will be maintained and not dry out.

Of course, installations are effected to increase the moisture content of a material. The relative humidity of the air is raised to such a degree, that to be "in balance," the material automatically absorbs it from the air. Such installations are usually separate from the process rooms, and used to treat a yarn which has become too dry, or sometimes to "condition" material specially, for a particular process.

All textile materials should possess their natural moisture content and apart from maintaining this during manufacture, for economical processing, the industrialist wishes to supply his material with this moisture content, as without it, he is losing weight—and selling by

weight, this means loss of money. The consumer also is anxious to receive this "conditioned weight," as whether weaving or knitting, he requires a yarn in first-class condition for his use.

The weaver and the knitter need most of the advantages required in spinning—maintaining the natural weight of the yarn, avoiding loss of "fly" in an otherwise brittle yarn with consequent waste of material, untidiness and maintenance of plant with frequent cleaning, but particularly are they interested in having a pliable yarn, soft and bendable, resulting in a perfect stitch formation with a full "handle" and a more pleasing appearance.

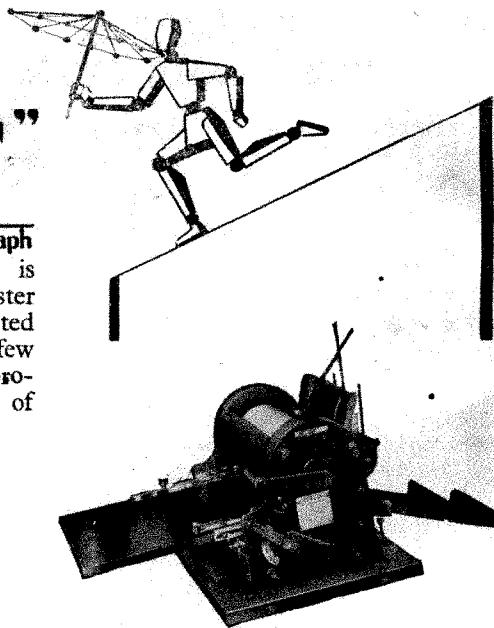
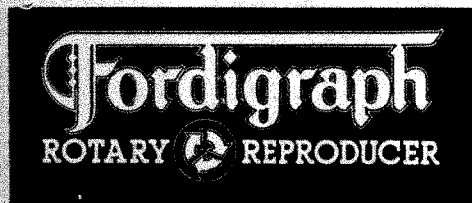
For Output and Health

From here, we have the drying and finishing processes, and again we find regulation of moisture control essential in certain of the processes, and the desire for ensuring the correct amount of moisture in the weight of material supplied to the user.

It is fortunately coincidental that the level of humidity conditions required in processing the yarn, is also an advantage to the operative, resulting in cleaner, purer, healthier and more invigorating working conditions. We have already seen that controlled humidity will lessen the tendency for fly and dust to permeate the atmosphere, avoiding the operatives' drawing this dust into their nose and lungs during respiration.

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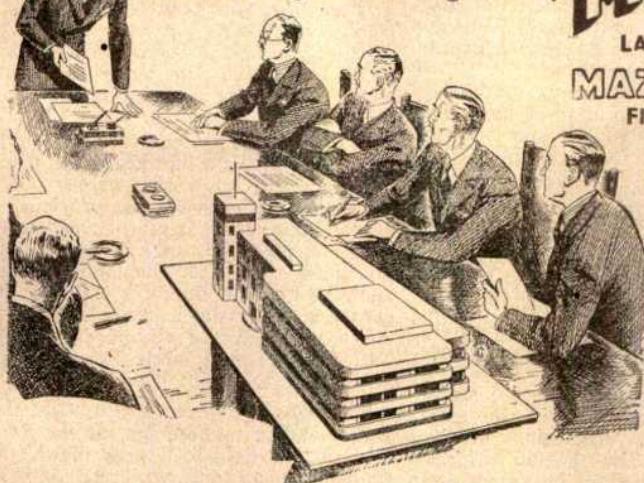


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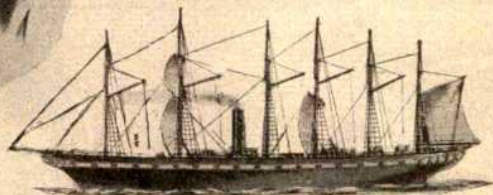
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In many of the processes, a high temperature is unavoidable, and in other cases, it is advisable. This high temperature, particularly during the winter seasons, lowers the natural relative humidity to a dangerous level, and the medical profession will advise that a hot, dry air is extremely harmful to the soft, mucous membranes of throat and nose, being a breeding ground for dangerous germs.

Another advantage of maintaining reasonable levels of relative humidity is that by so doing, the natural hot conditions of the summer can be lowered in temperature. Temperature reduction in the rooms will be in equal proportion to the height of relative humidity maintained. Furthermore, most efficient modern plants of to-day employ air movement in maintaining "weather" conditions required, and whether or not such plant brings in outside fresh air for further temperature reduction and for ventilation, the continuous movement of the air of the controlled humidifying plant is a further advantage to the operatives.

It will be seen, therefore, that the industrialist not only enjoys great benefit in the more efficient and satisfactory processing of his material, but that he also has a staff working with greater enthusiasm and invigoration, particularly during those stale periods of the afternoon when natural enthusiasm tends to wane, and he enjoys the possibility of less absenteeism due to their improved health.

Grinds Exceeding Small

THE new Griffin & Tatlock vibratory ball mill operates on a principle new to laboratory types and is designed for use in rapid grinding to a fine powder. Ball mills normally rumble on their own axis so that the balls cascade, and by friction between themselves and by falling under the action of gravity, they eventually reduce the material in the interstices to powder.

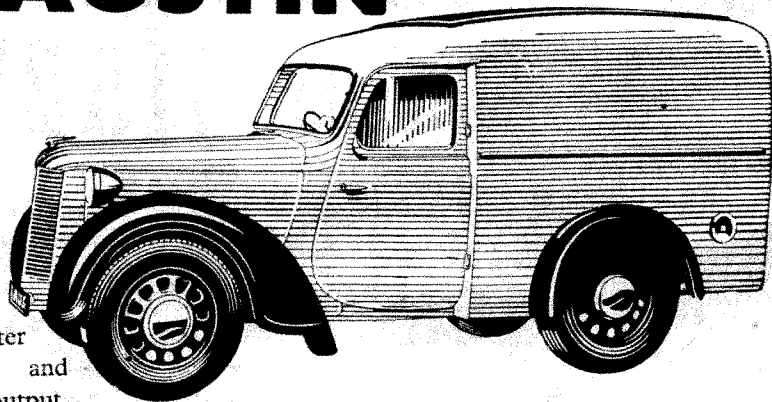
In the G. & T. vibratory ball mill the pot does not rotate on its axis. The distinguishing feature is the suspension of the pot cradle on stout steel springs, and the provision inside the cradle housing of an adjustable out-of-balance weight coupled, through a flexible bearing, to the motor shaft. By the combination of rotary and vibratory motion, the axis of the mill is caused to trace out a cylindrical path, so that every point on the circumference of the pot moves in a small circle, whose centre is the position of the point when the pot is at rest.

The balls then execute, not only the customary cascading motion, but, as the frequency of vibration is high, balls near the surface of the tumbling heap are projected and strike the opposite face of the pot. Disintegration of the larger particles at the point of impact takes place, while the general grinding action proceeds among the cascading balls.

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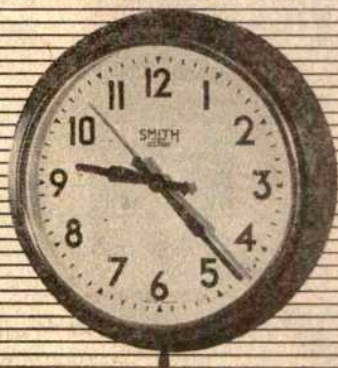
"HARVEY" Steel Equipment is portable. It can be dismantled and re-erected by unskilled labour without any depreciation whatever. NO fixing to floor or ceiling is necessary.

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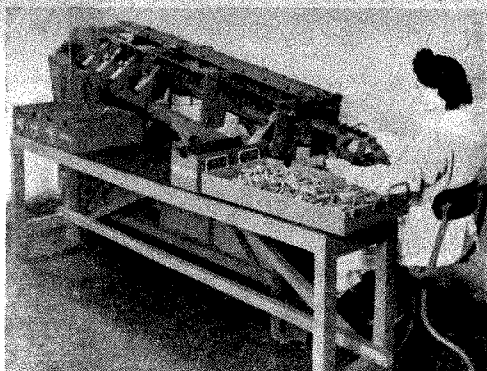
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A Better Lamp

THOSE who are using the reconversion period for the general overhaul of their factories will be interested in a new size of "Sieray" fluorescent lamp which has just been introduced by Siemens Electric Lamps and Supplies Ltd.

It is a 4-ft. lamp having a consumption of 40 watts, and is available in both "Daylight" and "Warm White" styles. The new lamp is fitted with bi-pin caps in place of the bayonet caps employed on the 5-ft. 80-watt lamp, and a special range of fixtures has been developed with suitable sockets to accommodate the lamp.

In these fixtures the starter switch is contained in a metal cannister which also contains a capacitor to suppress radio interference, the cannister being fitted near one of the lamp sockets. Chokes and condensers of elongated shape have been developed for the 40-ft. lamp, and these are housed in the actual fitting. The whole arrangement is very compact.

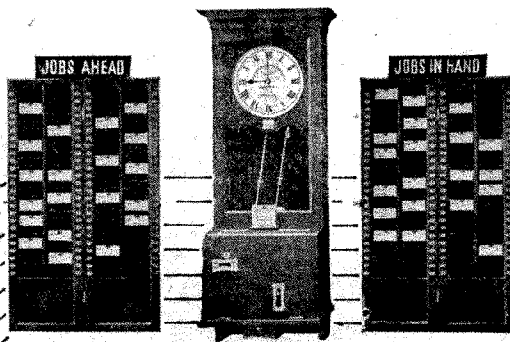


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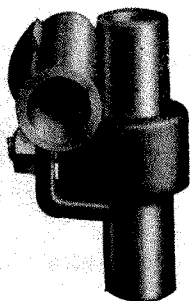
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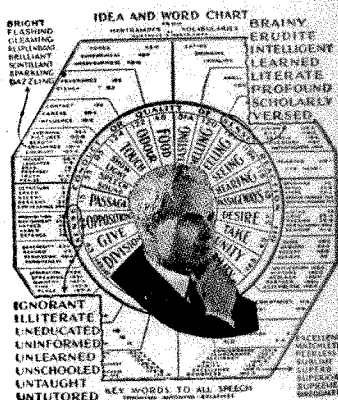
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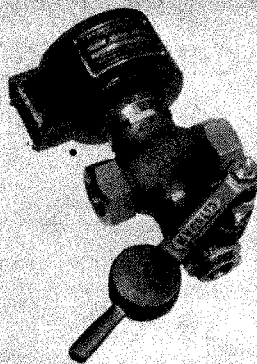
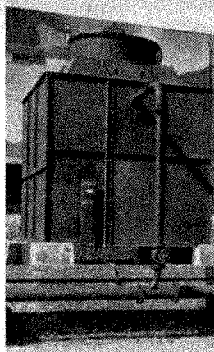
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HERE at right is the Magnetic Valve Company's new magnetic safety cut-out valve. It can be used to control any medium which is normally passed through a pipe—the majority of liquids and gases, including coal gas and producer gas, etc.—and will shut off the flow immediately the electrical circuit is broken.

On the restoration of the current the valve will remain closed until it is manually opened by the lifting of the hand lever, as the solenoid is not strong enough to lift the valve head off its seating; it will then be maintained open electrically until the circuit is broken again.

After the hand lever has lifted the plunger into the magnetic field it returns to the normal position so as not to interfere in any way with the closing of the valve. The method of operation is such that pressures, however high, do not affect the working of the valve.

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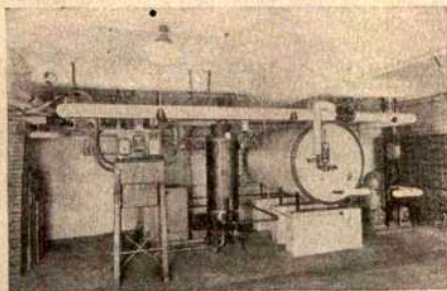
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This diagram reveals the hidden strong steel top cap which protects the toes when struck by

power expended being small in comparison with the cost of mains water.

The coolers have a substantial welded steel shell, the base of which forms the cold water tank. For very small duties, the shell is made in one piece and completely assembled.

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ingly simple, and no foundations are required beyond a flat solid base.

FOR the big scale finishing job, for complete coverage at a speed never before conceived, for the efficient application of every class of finishing material, for perfect finish at mass-production pace, the "Whirlwind" gun has got you covered.

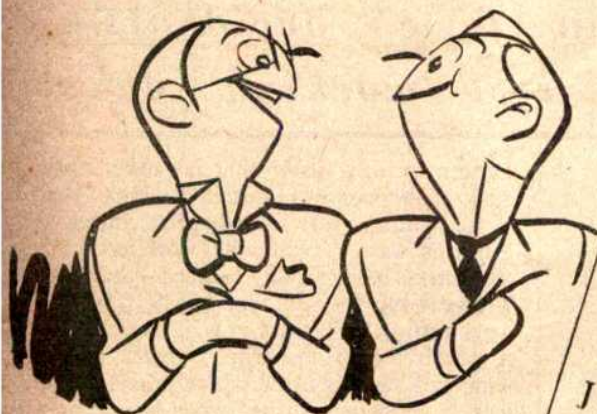
Manufactured by B.E.N. Patents Ltd., the "Whirlwind" is comparatively light in weight and is easy to handle. Machined to take a range of set-ups for all classes of spray work, the spray head is a separate hot brass forging. The material nozzle is of steel, case-hardened and ground, designed with an exceptionally deep taper to accommodate the drop forged brass spray cap and ensure correct alignment, freedom from wear and concentricity at the fluid tip.

Both the self-centring material-needle and variable spray control needle are of stainless steel, and the latter control enables the operator to vary the width of spray or change from round to fan form without discontinuing spraying. Any form of spray, from a "dot" to a wide fan, can be instantaneously secured, and the gun is simple to clean as well as easy to operate.

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Flooring—Now is the Time to Check and Make Good

By C. BRYANT

IN the October issue of *BUSINESS* an article on the rehabilitation of war-weary factories gave a switch-over check list for re-equipment and repair. At the top of that list was floor materials, finishes and coverings.

That floors should be given this high priority seems only natural. If the main fabric of a building is constructed from the foundations, it is clear that planning of the interior must start with the floors. Obvious? Let us see.

At this date, there are few contractors who can lay claim to being flooring experts, with a thorough knowledge and experience of every type of flooring and floor covering. Most flooring contractors specialise in the installation of one, or possibly a limited number of types of flooring materials, but are seldom able to give expert opinion and advice on the very wide and complex subject of flooring generally.

I have this from one of "the few"—Mr. Ralph B. Chapman—who has made a thorough study of flooring work in all of its many aspects, and has for many years, handled contracts for almost every class of flooring installation available.

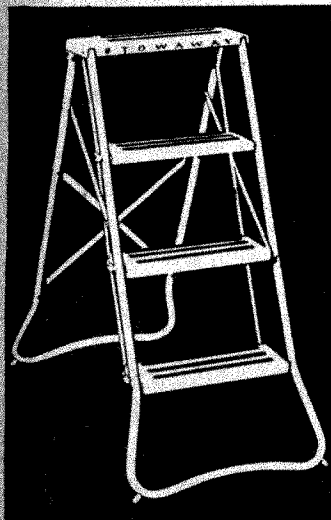
He tells me that the job of the flooring expert is to acquaint himself with every detail of his clients' requirements, and to investigate fully foundation and site conditions, and then to advise the most suitable type of flooring available, having regard to many factors, the most important of which are tabulated later in this article.

Such advice must be entirely without bias or prejudice and must not, if it is to be worthwhile, be impelled by the need to sell one or two types of flooring. Obviously, such expert opinion would only be forthcoming from the man who could offer to lay any and all types of floors, and was under no need to "push the sale" of any particular type.

Unless such qualified advice and opinion is sought by the prospective purchaser, there must always be a risk of selecting a type of floor which is found, only after a costly experience, to be unsuited to the particular purpose for which it was intended.

Mr. Chapman can give you a minimum of seven headings under which a new floor should be considered. Each is capable of sub-division,

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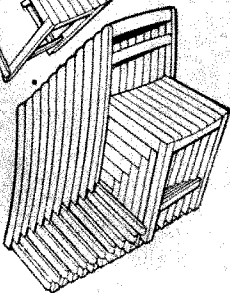
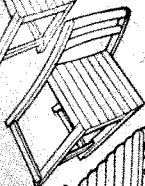
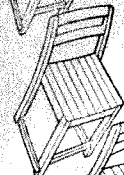
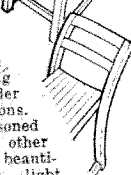
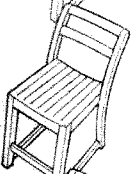
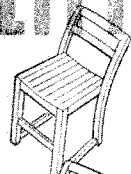
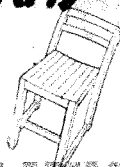
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"D-Day," said I. "That's a military term—what's it got to do with business?"

"D-Day, sir, is more than a term," he said. "It is going into the language for evermore as a symbol—a symbol of complete preparedness, of ultimate precision down to every last detail, before the word 'Go' is given and the real job started.

"Your D-Day, sir, is not on the Normandy beaches; it's right here in this office. And are you prepared?" he demanded, almost truculently.

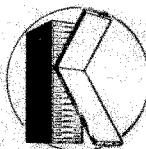
That fellow startled me, I'll tell you. When he first got busy on 'frustrated sales energy, dissipated sales energy, sales trends, population incomes and levels, population shifts, climatic requirements, and the like'—well, I thought it was all high-sounding stuff and a lot of 'hokey.'

That fellow knew his job all right. He touched me on the raw, but he got me in the end because I knew quite well that he was right.

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but for the sake of simplicity here are the skeleton seven:

- (1) Durability.
- (2) Resilience, sound, comfort, hygiene and warmth.
- (3) Ease of maintenance.
- (4) Suitability to specific requirements.
- (5) Type, having regard to the foundations.
- (6) Degree of proof required against damp, water, acids and fire.
- (7) Decorative and psychological characteristics.

The durability of all types of flooring material, says Mr. Chapman, is determined by the conditions under which they are used. The hardest wearing surfaces are generally to be found in the cement types of flooring, which are most satisfactory for both light and heavy industrial work.

The most popular types of covering for ordinary factory floors are granolithic paving specially case-hardened and rendered dust-proof, and Canadian hardrock maple flooring. For particularly heavy traffic, however, such as that found in breweries and dairies, steel-plated flooring is to be recommended.

Under lighter traffic conditions magnesite jointless composition, hard wood flooring, quarry and floor tiling, cork, rubber and linoleum will give many years of satisfactory wear. Most of these coverings will also be found suitable in domestic, commercial and public premises.

Consideration number 2, which may be given the general title of "Utility", is particularly

important. Much depends of course upon the use to which the floor is to be put.

Where people are going to use it for long periods, due regard must be paid to warmth, resilience, and a reasonable degree of noiselessness. With the exception of concrete, tile, terrazzo, mosaic and the like, most types of flooring possess these characteristics in some measure.

Linoleum, cork and rubber have them to a maximum degree; wood and magnesite to a lesser extent. Terrazzo and tiles are generally more hygienic than other types of covering, but not invariably so.

In these days of labour shortages, the problem of maintenance looms large. Although in the early stages it may take time, the treating of floors with wax at reasonable intervals saves manpower in the end. The hard skin of wax which forms on the surface is easily cleaned of dirt and defacement by light sweeping and mopping.

A well waxed floor will also last much longer than one that is kept dry, since the abrasive toll from foot wear is taken by the wax and not by the surface of the material itself. It does not follow that because a floor is waxed it must be slippery. The wax should be used with circumspection, or a non-slip type chosen.

Linoleum, cork, hard wood, magnesite jointless composition, tiles and even terrazzo paving take kindly to wax. Tiles and terrazzo also need periodical cleaning down with water and scrubbing.

"BROUGHTON Security" FOOT GUARDS

PROV. PATENT No. 6867/44



★ Interchangeable
between workers

★ No "lefts" and "rights"

★ Completely protects
the toes

★ Light and comfortable to wear

★ Protects footwear

★ Easily fitted
and removed

★ Low Cost

★ No Coupons!

Further details on application

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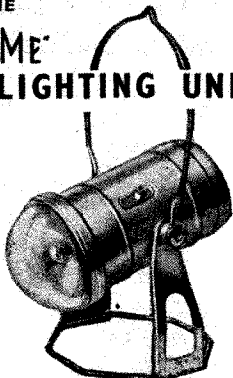
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DYNAMIC ADMINISTRATION

Continued from page 37

agencies through which managers could consult the people whom their orders affected. Nobody regards himself as insulted, or ordered about, if he has to catch a train according to a railway company's timetable. The timetable enables a large number of people to co-operate successfully in securing transport from A to B. The orders and regulations which a business issues are usually only its equivalent railway timetables."

The Administration of Groups

Dealing with the question of the desirability, or otherwise, of firms breaking up into small units, Col. Urwick said, "The tendency in British industry is to get unwieldy units. The decision to create a headquarters, independent of the parent company, and to treat the parent company as one unit in the group, is nearly always made too late.

"Cases, too, are constantly occurring of a parent company developing subsidiary companies, but failing to distinguish the management of the subsidiary companies from the management of the parent company. The parent company tries to manage the subsidiaries by some extension of its own management, long after it ought to have realised that the parent company, however important, is merely one unit in a group of units. A separate headquarters should have been set up to run the group, which includes the parent company and the subsidiaries."

Col. Urwick ended with a description of the very first considerations which business men must understand if they are to put into practice the philosophy of life which is dynamic administration.

"The art of management," he said, "is like the art of medicine. In the old days, when we wanted to teach a man to be a surgeon, we apprenticed him to a barber. Now we make him study anatomy, physiology, etc., and send him to a hospital, and finally give him a great deal of practice under supervision. In just the same way, up to a few years ago—and in many firms this is so even to-day—it is thought that all you have got to do to learn to manage, is to work alongside one of the older managers in the business for a certain length of time.

"It is forgotten that there is an anatomy and physiology of management, that a man must

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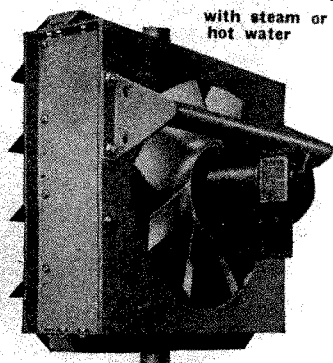
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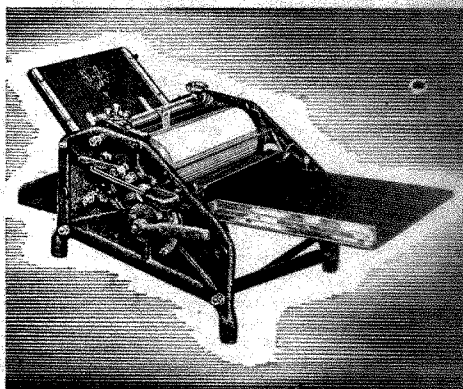
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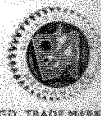
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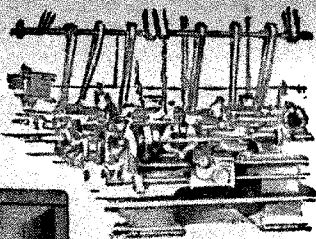
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practical training. It is forgotten that he ought to have a great deal of definite practice under skilled supervision before he is entrusted with people's lives and social habits. You apprentice a man for five or six years before he can become a fitter, in case he breaks up some expensive piece of machinery. It does not seem to occur to people that an even more thorough apprenticeship is required before a man becomes a manager. Yet human beings are much the most delicate and expensive machinery in any factory.

Management's Responsibility

"The learning process in management is not just a matter of book knowledge and theory. The practical part is much more important. No man is allowed to practice medicine until he has the most elaborate qualifications. Even the most elementary of these qualifications involve passing a whole series of oral and practical tests before a board of trained medical men, who are themselves highly qualified members of the profession. Managing one hundred people in a factory involves far more responsibility for the health and happiness of other people than treating a few score patients. Yet we allow all kinds of individuals just to drift into managerial positions without any training or qualifications whatever.

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PERSONNEL MANAGEMENT

By C. H. NORTHCOTT, M.A., Ph.D.

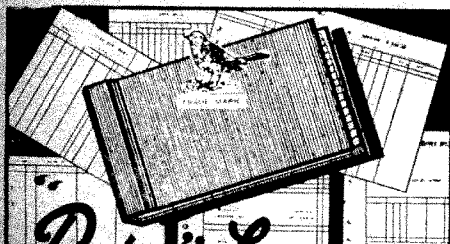
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THE CUSTOMER MUST HAVE WHAT HE WANTS

Continued from page 49

When we had reached and held that achievement in peace-time, we felt it would be time enough to go on to decide the next objective.

Everyone in the firm agreed that objective including the 200 of our fellows who were away in the Forces but who were kept in touch. It was, and still is, the highest common factor of our common interest.

So, we made our post-war management chart designed to that end and posted it on our factory walls as well as in our sales office, in our accounts office and in our chief engineers' office for everyone to see and understand. That's the objective we are now working to.

It brings our outside men right into the heart of the firm so that they feel now more than ever they did, that they belong.

It keeps our costs and records folks and our accountancy staff right on their toes, and most important of all, I think, it lets everyone in the factory who is interested, i.e., the superintendents, foremen, and leading hands, as well as the trades union members of our works committees—it makes them all begin to realise what the management task is in loading on work at good wages, day-in, day-out, week-in, week-out, month-in and month-out, for a total of over two million man hours in a year that have to be carefully pre-planned for.

So, we are going ahead now with a healthily restless firm of people doing all they can within their spheres of operation to serve that common objective which we all share. We are searching the home and export markets for the future of all machinery required in civil engineering, building and contracting.

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Now, what is the simple lesson of all this. Just this. In trying to organise and manage a business democratically in the twentieth century you must first of all discover a common objective that is the highest common factor of interest for everyone connected with that business, then find democratic means of making it possible for everyone in that business to give his or her share towards the problem of balancing steadily the production with the sales, and the finance with the planning of the business.

That's all. Inside an agreed common objective your specialists will find plenty of opportunity to follow their own special crafts and interests.

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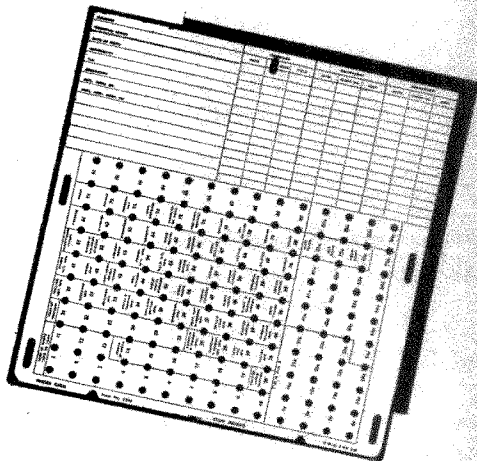
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GETTING TOGETHER TO STEP UP P.M.H.

Continued from page 40

the methods adopted in launching the project. First of all, curiosity was aroused by exhibiting the four posters, not simultaneously, but at intervals of three days between the appearance of each one. The build-up was carefully planned so that the whole story was not revealed until the fourth poster was exhibited, nine days later.

Getting the Ideas Across

The posters were designed to symbolise the same message; the words built-up progressive interest. The last poster had fixed to it the booklet "This Business of Getting Together." This last poster synchronised with the distribution of the booklet to every worker. The day before the workers received the booklet, however, the shop stewards' letter was in the hands of everyone interested, so that it was evident to all that our drive for co-operation was not a management stunt, but was a truly co-operative movement in which the workers themselves were playing a leading and a vital part.

We attach considerable importance to the use of publicity methods for disseminating information. Our Works Relations Officer enjoys a status which enables him to get first hand facts quickly, and he is responsible for their presentation. We do not believe that a plan of this nature can operate successfully unless such measures are taken. An essential feature is an information service which will not only report meetings of the committees, but which will also educate employees on the concern's activities, and show these in relation to national economic and social problems.

Elections took place on December 21st. The committees are taking their responsibilities seriously. There is a lively interest in every matter pertaining to the factory, and we hope that effective results will be seen within a very short time.

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Health- *in Industry*



Reducing Dermatitis Risks 8 Preventive Measures

By SHAUN CLEAVE

IT may be that you are in the fortunate position of maintaining an efficient Welfare Department in your factory to safeguard the health of your workers. But even so, as a progressive employer it is important that you yourself should be really knowledgeable about the commoner industrial or occupational diseases which may cause sickness and absenteeism amongst your employees.

Perhaps of all these occupational maladies industrial dermatitis is the best known. Dermatitis is the name given to any inflammation of the skin causing redness, scaling or spotting. It is caused by any irritant, organic or inorganic, which lodging on the skin surface interferes with its natural functions. The skin presents a larger surface for the reception of, and for reacting to, impulses from the outside world

than any other organ. It acts as a protective envelope to the rest of the body, as an organ of excretion of waste matter or sweat and as an organ of sensibility.

To ensure the healthy action of the skin it has to be kept clean. Minute particles of matter, organic and inorganic, settle on our skins continually without the slightest risk to that organ's efficiency. But if a man's skin is continually exposed to an excessive amount of dust, fumes or oil for instance the risk of him incurring dermatitis is very strong. For these foreign bodies settling on the man's hands, arms, legs or body in considerable quantity, aggravated by the friction of his clothes, his sweat and the heat of his working atmosphere begin to interfere with the natural function of his skin.

Offensive Against Industrial Disease

During 1946 Health in Industry section of **BUSINESS** will feature month by month the treatment of various industrial diseases.

Causes will be examined by experts and methods of prevention of disease and industrial accidents will be given in detail with diagrams and pictures whenever possible.

Occupational Incidence

All forms of dust including metal and food dust tend to block up the tiny skin pores, whilst micro-organisms, e.g. anthrax, which may be attached to animal skins and hairs, may enter the skin by the smallest lesion causing sub-cutaneous and even general infection. Strong acids or alkalis or pure disinfectants have a caustic action on the skin. Let us now look at those trades which have shown the highest incidence of industrial dermatitis. They include:

1. Engineering processes of all kinds where cooling fluids and lubricating oils are constantly in use.
2. The manufacture of bichromate of potash and its use in tanning.
3. In processes entailing the use of lead, arsenic, mercury and other compounds.
4. In paint shops and dope factories where "thinnings" is used.
5. Skin and hair sorting and packing. Here the irritant may be a micro-organism, e.g. anthrax.
6. Galvanising and moulding of metals.
7. Chrome dipping.
8. Oil seed crushing.
9. Manufacture of aluminium.

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HEALTH IN INDUSTRY

use of strong acids or alkalis. 11. Paper and rag sorting. 12. Sand blasting. 13. Dry soap packing. 14. Flour milling. 15. Sugar refining. 16. Tea grading and packing. 17. Jute spinning.

This imposing list only covers those industries where there is a particularly strong risk of dermatitis to the worker. There are numerous other industrial processes where there is a fair hazard of dermatitis.

From the point of view of the employee dermatitis can be a most distressing complaint. In addition to the skin irritation which he suffers he may find that in spite of treatment the complaint persists for many months, and may even become chronic.

The Measures to Take

In some cases it impairs the efficiency of the fingers or toes. It may mean prolonged absence from work with consequent financial loss, and great mental distress. It should be a comforting thought to employers to know that the preventative measures to be adopted against this objectionable complaint are quite simple, and of a nature beneficial to the general health of his employees. These measures should comprise:

a. Adequate shop ventilation including the installation of suction ducts or fans directly over or behind processes where dust and fumes are thrown off. In this way the shop atmosphere is kept reasonably pure.

b. The issuing of, and insistence on the use of, protective clothing, e.g. caps, overalls, aprons, gaiters, special boots or gloves. These all reduce the area of the worker's skin exposed to the effects of irritants.

c. Rules assuring the regular and frequent laundering of such protective clothing. Individual standards of cleanliness vary enormously so that generally speaking it is most satisfactory for the shop foreman to be responsible for the collection of this clothing from everyone and it can then be sent to the firm's laundry.

d. An adequate number of wash-basins with soap and clean towels. Also just as important to have a system whereby every worker is allowed sufficient time to wash after work.

e. Making available protective ointments, which applied by the worker to his skin, chiefly the hands and arms, before commencing work acts as a barrier cream preventing the pores from being clogged by dirt. For obvious hygienic reasons this ointment is best used from the worker's own individual jar rather than from a communal jar or container.

f. Or by issuing cleansing jelly which can be used by the worker when he washes his hands after work. This jelly efficiently removes oil and dirt from the hands without the abrasive action of hard brushes or pumice. It can be issued to the workers at the very modest cost price from the Welfare Department.

g. By the provision of neutralising fluids for the use of workers engaged in processes where strong acids or alkalis are used.

h. Regular inspection by trained persons of the skins of employees who are engaged in work involving strong acids or alkalis.

Cleanliness then is obviously the greatest safeguard against industrial dermatitis. Of

soap and water, and if left to himself would wear the same pair of overalls for months. This is obviously a case for the tactful intervention of the Welfare Department, who will deal with it in their own way.

This department will also see that no new employee who has a history of dermatitis in any previous employment is engaged on work where there is a special dermatitis risk. Incidentally it is interesting to note here that it is usually persons with fair dry skins who are most prone to dermatitis.

In spite of every effort to prevent it dermatitis may occur in even the best regulated factories. It has been my experience to find that the word dermatitis is a particular bogey of the average factory employee. Perhaps this fear is a relic of the bad days of industry pre-1918 when dermatitis occurred only too frequently in factories.

Whatever the reason I have found that skin rashes have been reported with great promptitude—and what a good thing! Let us assume then that a worker reports a rash on his hands, between his fingers, or perhaps round his waistline—for dermatitis is not confined to any particular part of the body.

The very location of the rash may at once indicate that it has been caused by the man's work. For example the rash may be on the top of the thighs where the man is continually splashed by machine oil. Sometimes, however, the presence of the rash is not consistent with the nature of the man's work, and opinion as to its cause has to be suspended.

A Vital Welfare Job

A worker who reports a rash which, to the factory nurse, appears to be a probable case of industrial dermatitis should, ideally, be removed from the "suspected" process immediately. If the condition is slight, and it seems reasonable to suppose that after cleansing, the affected skin surface will quickly respond to frequent applications of calamine lotion, all will be well.

It may be, however, that the condition will mean absence from work under medical supervision, and it may be necessary for the worker to claim damages from the firm. In any case I would stress the importance of removing the man immediately from his previous job as this often proves the most efficacious treatment of all. If he is able to continue working without retarding the skin treatment he should be given some alternative work and, whenever possible, this should be as pleasant and light a job as can be offered him.

The psychological importance of the management's practical sympathy, in such cases cannot be over-stressed. It is very probable, too, that the man will feel sensitive of his workmates' repugnance for skin diseases. Here the Welfare Department will help by assuring him that it is not infectious (as indeed comparatively few of these cases are infectious), but that for his own self respect he will want to use his own towel and soap.

Industrial dermatitis often occurs when a worker's general health is below par, and in any case it usually results in a condition where a medical specialist's aid is indicated.



The illustration shows the Perihel Mixray Sunlamp Table Model (combining Ultra Violet and Infra Red) for medical treatment in Surgeries and for Home Use.

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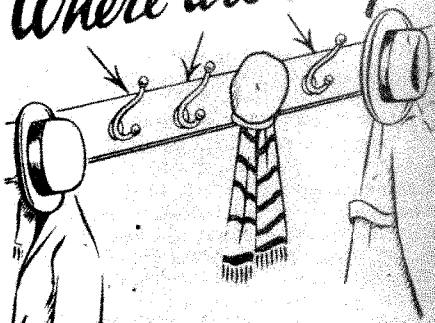
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Home Accident Revealed

Cure for Worn, Sore Finger-tips

By JOHN GILBERT

OBSERVATION on the part of a married woman operator employed by Medway Paper Sacks Ltd., furnished the company's welfare officer with the solution to a problem which has been troubling hundreds of medical men for more than half-a-century.

Sore finger-tips, the result of abrasion, due to the handling of rough textured materials, are common, but not only in the paper industry; frequently they are an obstacle to efficient output in the cotton, rayon, printing, and light engineering industries.

At best sore finger-tips are a distracting annoyance affecting the worker's concentration on the job; at worst they are the cause of those short but aggravating absences which upset the rhythm of planned operation routine.

Medway Paper Sacks Ltd., is engaged on making large sacks from strong brown paper. The material has a rough finished surface, and the sacks are sealed at one end by feeding them into a wire-stitching machine. The paper passes

into this machine with a rapid, spasmodic motion, and is guided by the operator's fingers.

Female labour is engaged for this work and during an eight hour day their fingers are rubbing over the rough, dry surface of the paper. This amount of friction causes damage to the finger-tips, and until recently, about two thirds of the girls working on the stitching machines were forced to visit the surgery for treatment at least once a fortnight.

A striking feature about the affected finger-tips was the absence of the horny layer of the skin. This is not too clearly brought out in the accompanying illustration, but the drops of blood exuding from the tips of the middle and ring fingers can be plainly seen.

These two fingers were the ones usually most seriously affected. The thumb generally escaped injury. Often there was a general hypertrophy of the skin of the finger-tips, producing a bulbous appearance.

Various measures had been tried to prevent this trouble. Industrial rubber gloves were

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useless, as the worker lost her sense of touch. Thick rubber finger-stalls failed for a similar reason and output was slowed up. Tried too were the thin rubber tips; they could only stand up to the work for a few hours and then had to be replaced. Trials were made of a hard setting rubber solution painted on the finger-tips before starting work. This was satisfactory, but was discarded because the solution had to be reapplied every two or three hours.

Keeping a Case History

At this stage one of the workers volunteered the information that three weeks previously she had accidentally splashed a finger with 20 vol. hydrogen peroxide while dressing her child's hand. She noticed during the next few days on the machine that this finger-tip did not get sore like the others. She therefore tried applying peroxide to all her finger-tips.

For the first week she did this at night and during the dinner-hour. Her fingers were so much better that during the second week she applied the peroxide at night only. The number of applications was still further reduced to three or four during the third week. To her surprise she had had no sore finger-tips since using peroxide. For four years she had been working on stitching machines, and had often attended the surgery for treatment.

It was clear that this remedy was worth investigating. Six of the worst sufferers volunteered for a trial, and the result was so promising that arrangements were made to issue peroxide to all the workers (21 in number) who had been troubled with sore finger-tips.

These 21 girls were given 1 oz. wide-neck bottles, three parts filled with 20 vol. hydrogen peroxide. The bottles had a bakelite screw cap and were labelled with the worker's name, clock number, and date of issue. The women kept them in their handbags.

Instructions were given to dip each finger-tip into the peroxide, and to wave the hands in the air till the liquid dried. This was to be done three times a day—at night, on starting work in the morning, and during the dinner-hour. Within a few weeks it was quite clear that this routine was producing a notable improvement in the fingers of all the girls. By subsequent inspection it was found that in many cases the fingers could be fully protected by reducing the number of applications to three or four times weekly.

The effect of the treatment is indicated in the accompanying table, which compares over two periods of six months the surgery attendances of 12 of the 21 women who had been working under identical conditions both before and after treatment.

No comparison has been made in the attendances of the remainder whose work during the two periods is not exactly comparable. They had been doing other work at intervals, or had been working with different sorts of paper, or had left during the period of the test.

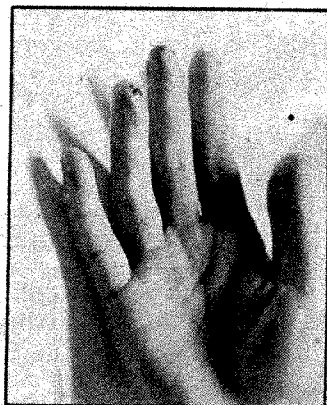
Efforts have been made to find out exactly why peroxide should prevent sore finger-tips, but without success. It may act by coagulating proteins in the skin, thereby increasing the resistance of the skin to friction. The women themselves are in no doubt that the treatment has been beneficial, and it has been simple to administer. Their bottles of peroxide require filling every four to six weeks, and they come regularly to the surgery for this purpose.

The success of this small experiment would appear to make it worth while for industrial medical officers to give this method a trial.

My thanks are due to the management and staff of the Aylesford Paper Mills and Medway Paper Sacks Limited for their help in carrying out this investigation, and for their permission to publish.

Surgery Attendances for 12 Workers for the Treatment of Sore Finger-tips.

Worker's Initials	Number of visits to Surgery	
	Six months before using peroxide.	Six months after using peroxide.
E.D.	17	2
C.F.	34	2
K.B.	24	5
B.T.	12	1
O.J.	19	3
G.T.	10	1
V.K.	11	2
E.H.	9	1
J.H.	14	1
K.B.	14	0
N.G.	24	3
R.C.	4	0



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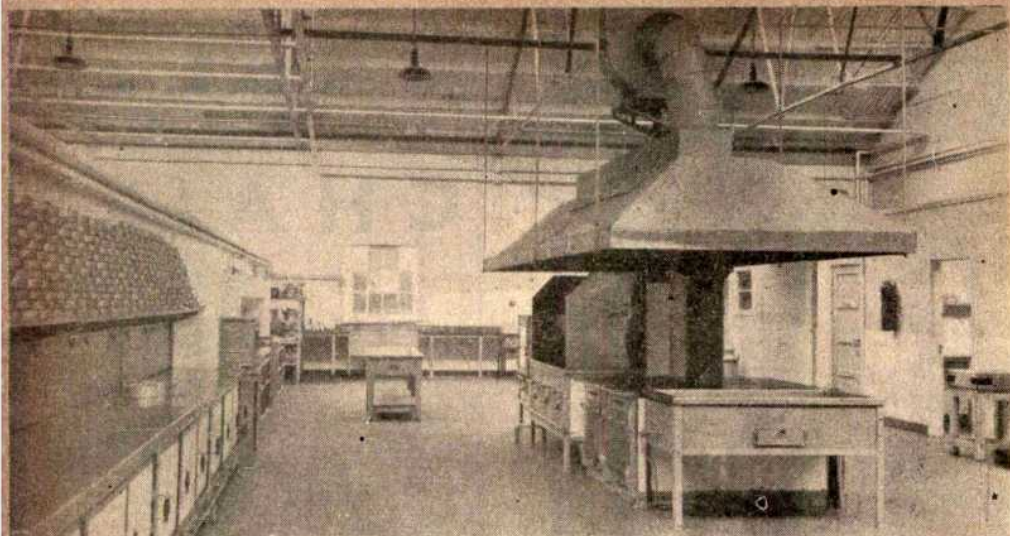
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The Canteen Manager is Vital Link in Production

What Should He Know About Dietetics and Nutrition?

By FRANK MOON

of Business Canteen Advisory Panel

IT would appear opportune at the present time, when we are all engaged in tuning up for peace-time production, to review our food position, and its effect on public health. There appears to be a general feeling of lassitude, tiredness, and weariness amongst the population of this country which is only to be expected after six years of concentrated effort.

We have been living on our nerves, and working at peak pressure for most of this period, and whilst the urge for the effort remained, we called upon all our reserves. There is no doubt that certain nutritive qualities have also been missing from our diet during the same period, and, to compare the human body with the motor car engine that has just completed a hill climb on paraffin and insufficient oil, we are "pinkening" and our "big-ends" are "knocking."

We are repeatedly assured officially that the nation's health has improved through rationing and yet we find the Croydon Medical Officer of Health stating that "although it would be an exaggeration to say there is a general state of sub-nutrition, it is not unlikely that the restriction of such articles as milk, meat, and butter is not helping to maintain high nutritional standards among all sections of the population."

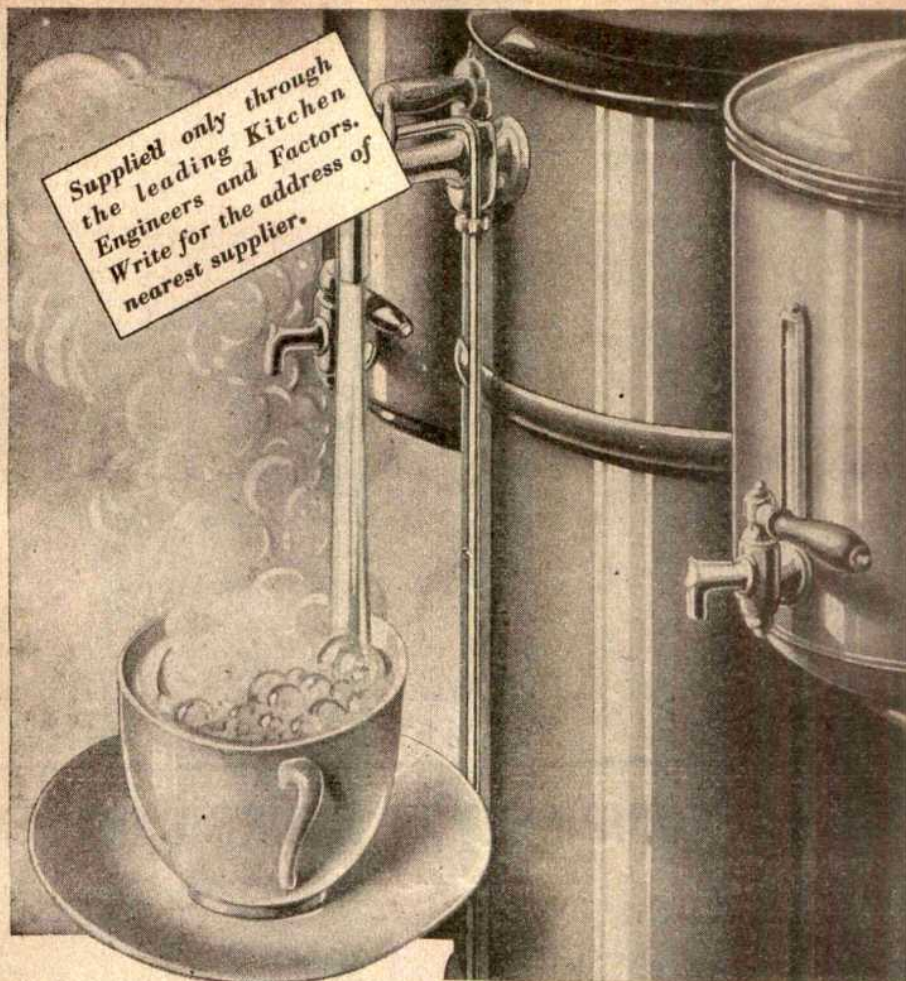
One does not need to be a doctor to notice

When the war finished we were on the ropes physically, and one final punch would have put us down for the count. It is agreed that the death rate is lower, but lowered vitality is not always reflected in official figures and graphs, and whilst fatigue, boils, styes, etc., do not necessarily result in absenteeism, there is a "slow-down" in production.

Does the average canteen manager realize the importance of his job in relation to factory production? Is he making the best use of the available rations? Just as the engineer knows the correct proportions of petrol and air for the efficient running of an internal combustion engine, so should the canteen manager know the technique of balancing a meal to ensure the efficient running of the machine operator.

The science of dietetics and nutrition is so wide and complex a subject that it would be impossible to do more than touch the fringe in a short article. I will attempt to outline the broad principles in a brief manner, but I would advise all those concerned with menu planning to get text books on the subject, and so provide themselves with a more comprehensive survey of food values.

Food has three primary uses. (1) To build and repair the body. (2) To provide energy and warmth. (3) To protect the body from disease.



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are useless without the third, just as air without petrol, or petrol without air, would not drive an engine.

In class (1) we have proteins or flesh forming foods. Class (2) are the fats, or fuel foods and carbohydrates. Class (3) contains the protective vitamins, minerals, etc., to provide the means for the efficient functioning of the glands, which fight disease.

Fuel for Work

The average manual worker requires about 3,500 calories per day, heavy workers up to 4,000 per day and lighter duty workers down to 3,000 per day. Calories are the units or horse power of food necessary to replace the wastages of energy, and body tissue which is lost during our hours of work, sleep and play. A calory is the amount of heat required to raise the temperature of 1 kilogramme of water by 1 degree centigrade. As the body is like the firegrate we must provide sufficient food to keep the spark of life aglow just as we must provide coal to keep the fire alive.

How is the canteen manager to determine the above quantity? A well known authority gives the following table as the dietary requirements per man per day. These are optimum figures and the case of canteens which usually provide only one third of the daily diet the figures should be divided by three, on the assumption that the consumer will provide the other two thirds from the meals he gets at home.

Calories.	Proteins.	Grammes.	Fats.	Grammes.
	Animal	Plant	Animal	Plant
3,500	50	50	100	20
Vitamins in I.U. or Mg.				
A	B.	C.	Riboflavin.	Niacin.
7,500	3 Mg.	75	3 Mg.	10 Mg.
Minerals.				
Grammes.				
Calcium	Phosphorus.	Iron		
1.5	1.5	.020		

It will be appreciated that the average caterer has neither the time nor the knowledge to analyse each item of the diet, but certain broad principles should be followed to ensure that the main meal of the day is as near dietetic perfection as possible.

If, therefore, I give a rough definition of the various constituents forming our diet it will help the caterer to approach the composition of his menus from a more scientific angle so that he may avoid a meal which consists of too large a proportion of body building foods without any energy foods.

Calories.

1 oz. of fat	beef is said to represent about	150 calories.
1 oz. of bread	" " " "	100 "
1 oz. of cheese	" " " "	30-40 "
1 oz. of cabbage	" " " "	8 "
1 oz. of sugar	" " " "	120 "

Proteins or Body Building Foods.

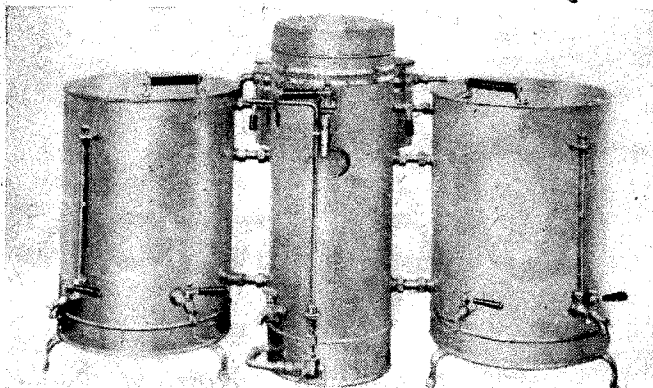
These consist mainly of meat, fish, eggs, milk, cheese, peas, beans, lentils, oatmeal, etc. Both animal and plant foods supply a flesh forming diet, but bulk for bulk the animal food is more concentrated.

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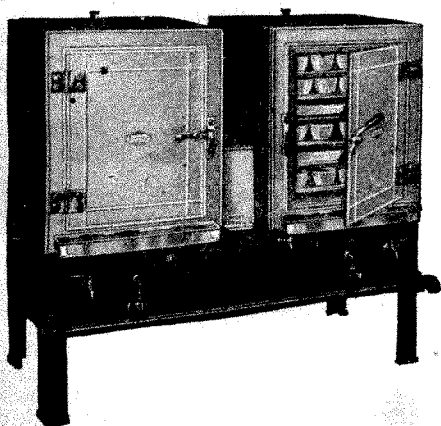
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Provide energy but do not take the place of the protective foods. Consist of sugar and starches, and are found in bread, flour, potatoes, cornflour, rice, semolina, sugar, beetroot, honey, fruit, milk, etc. They should not be allowed to predominate in the diet as they act like a whip but do not provide the stamina to back up the expenditure of the energy.

Vitamins and Minerals.

These are protective materials and are indispensable. They are present in milk, butter and eggs, green vegetables (especially when raw), lemons, oranges, tomatoes, fish (especially herrings), liver and lean meat.

Plan the menu to contain a suitable amount of each of the above body-building, energy and protective foods, and the caterer is playing his part in the national effort to increase peace time production.

How the Psychologist Helps Eliminate Worker Friction

MANY aspects of the vital factors effecting good relations between employer and employee have been covered in the three articles of this series, and now I must make my conclusion.

The psychologist can, as a rule, do no more than indicate the proper course: he can act as a sign-post, but, like the sign-post, he cannot give directions about the details of how to get from one place to another. The goal he can indicate: the details of the journey must be worked out by those who clearly apprehend the terminus. The industrialist may know how many motor cars are needed in a given time, but the psychologist can help him to avoid the pit-fall of going bull-headed at an object in such a way as to transgress the principles of psychology, and so precipitate trouble. To confer happiness on a certain number of people by supplying them with motor cars, while, in the process, rendering the lives of a large number of other people miserable, is the path to industrial trouble. The psychologist can give warnings, but he cannot be called upon to arrange the industries of the country in conformity with the principles of psychological science: that is the task of the industrialist.

I must make clear at this point that there is no special psychological reason for supposing that industries run by the State are either more or less likely to result in an increase of human happiness: the principles upon which such happiness is based are always the same. But there seems to be little doubt that much of the present clamour for the State to take over this or that industry is based, almost or quite unconsciously, on the knowledge that privately run enterprise has failed to take into account those factors that are essential for contentment.

There is no doubt that far too little attention has been paid to the "social" sciences as com-

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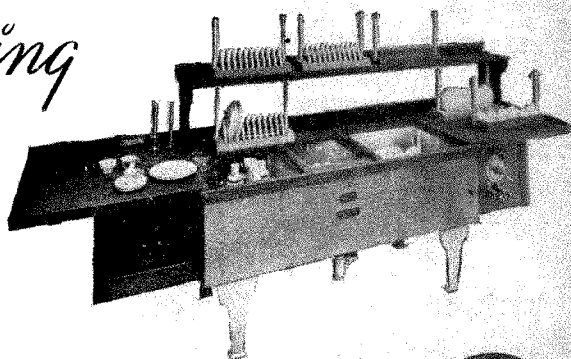
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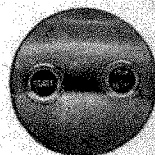
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paid obvious dividends, both in peace and in war; but, from what has been said above, it should be clear that industrial peace (and, therefore, human happiness) could be brought much nearer if at least as much energy were spent on research into the causes of human discontent. It must be realized that so young a science as psychology cannot be expected to provide answers to all problems of human behaviour, either as affecting the individual, or the group. Enough has been said in these three short articles to demonstrate that, unless there is great advance in the science of psychology, further progress in technology can only be to our disadvantage, inasmuch as it will pose more and more problems which our ignorance prevents us from answering.

What clearly emerges from our discussion is that, by some means, a greater degree of independence must be given to small, self-governing groups. That is not to say that large industries must disappear in order that small businesses should co-operate with one another in fulfilling large and complicated orders.

If the group depends upon its own skill for its livelihood, it is quite unnecessary for the central management to appoint or dismiss hands: the group will look to its own preservation, while it may, on occasion, think fit to continue to employ an old man, simply because the members like him, whereas a central management could never take the humane attitude that a "passenger" could be kept on the payroll.

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Restaurant seats 350—Large Lounges and Ballroom, Bars, Billiards, Table Tennis, etc.

LONDON 1½ hours

CLIFTONVILLE HOTEL Margate 444



Leading Makers, since 1875, of
Diaries, Calendars and Blotters
especially for Advertising.

D. HARPER & CO. LTD.

258-262 Holloway Road, London, N.7.
Phone NORTH 3822

ALDBOROUGH COUNTRY CLUB

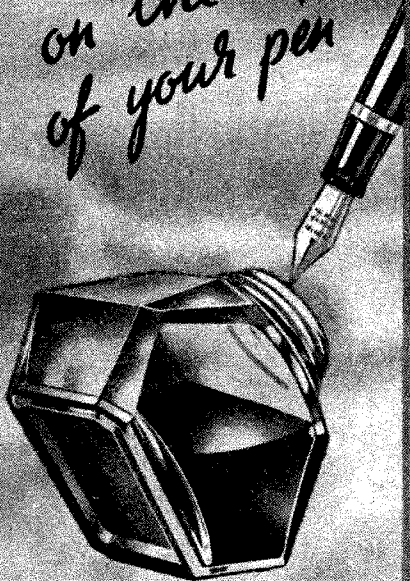
An Elizabethan Country House in 10 acres of delightful grounds, within easy reach of Harrogate, York and Ripon.

Tennis, Badminton, Miniature Golf, Fishing, &c.
Good Food and well-stocked Bar. 25/- per day.

Write: **THE SECRETARY,**

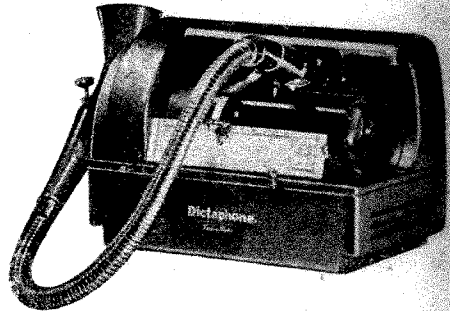
ALDBOROUGH HALL, BOROUGHBRIDGE.

*it's Right...
on the tip
of your pen*



Waterman's Ink

IN THE FAMOUS 'TIP-FILL' BOTTLE
8 BRILLIANT COLOURS
From all Stationers and Stores



is the vital need of every executive—to get thought translated into deed just as quickly as possible.

You cut out a lot of waste movement with the dictating machine, you save an hour a day of your own time, all the time and effort your secretary spends in your room taking down your words and reading her notes—another two or three hours a day.

While you dictate she goes on transcribing; you never use two people to do the work of one. You get quicker action all through your organisation, less waiting, less delay, fewer mistakes, better work.

Call, write or 'phone for "Office Methods & Practice" (Free). It tells you all about

Dictaphone *Dictating Machine*

THE DICTAPHONE CO. LTD.

(Thomas Dixon, Managing Director)

(Dept. H) KINGSWAY HOUSE, KINGSWAY,
LONDON, W.C.2.

Telephone: HOLborn 4161 (5 lines).

And at MANCHESTER, BIRMINGHAM, BRISTOL, GLASGOW,
LEEDS, LIVERPOOL, NEWCASTLE-ON-TYNE, DUBLIN
and BELFAST.

FAMOUS ADVERTISING CHARACTERS

spring
brilliantly to
attention

AT POINT OF SALE

Thanks to

TRAPINEX Paint TRANSFERS

BRILLIANTLY Because they are produced in special paint which is many times brighter than printers ink and stands out in bold relief.

CUT-OUT EFFECT Unique opportunity for striking design with no film paper background to mar the distinctive effect or obscure the goods on display. Hence retailers welcome them,

EASY TO APPLY The transfers are readily applied to window glass or any other surface according to the simple directions printed on the backing of each transfer.

PERMANENCE Because they are paint, Trapinex Transfers will stand weather and washing indefinitely and are therefore usually applied to window exteriors.



One of many association signs in
TRAPINEX Paint TRANSFERS



TRAPINEX PAINT PRINTING

The same brilliant effect can be obtained by direct printing in our works on plastics, metal, wood, glass, fabrics or any other permitted material, for showcards, roof cards, decorations, etc.

ADVICE

Advice freely given but when you write for prices please state: (1) Size; (2) Quantity; (3) Number of Colours; (4) Purpose; (5) Wording required; (6) a rough sketch would help.

For ALL
DISPLAY
PROBLEMS

TRAPINEX
Paint PROCESSES

TRAPINEX (Regd.) PAINT TRANSFERS are FULLY PATENTED & MANUFACTURED ONLY BY
TRAPINEX LTD., 8 Commerce Works, 43 Commerce Road, N.22
Phone: BOWes Park 2689. Grams: Trapinex, Wood, London

Now you are able to radio **pictures half-price**

OR LESS!

Cable and Wireless Ltd. are happy to announce reductions in the rates for overseas phototelegraphy, ranging from 50% to 80%. For example, the cost of sending a press photograph of 150 square centimetres to or from any Empire terminal is now £3 instead of £10; and the cost of sending a commercial or personal photograph of the same size is £5 instead of £10. Once again Cable and Wireless have demonstrated their consistent policy of development and rate reduction.

Cable and Wireless

PIONEERS OF CHEAP COMMUNICATIONS

Cable and Wireless Ltd., Electra House, Victoria Embankment, London, W.C.2

Fuel wastage may be reduced by **THERMAL LINKAGE**



The ultimate step in TOTAL heat utilisation

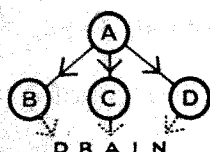
What is Thermal Linkage? It is more than a fuel saving device—it is today's technique in production efficiency and economy.

It is an organised linking of your heat resources with your heat-using

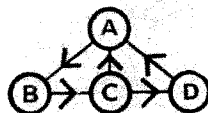
plant, to ensure that no heat escapes without first doing all the work it can.

It is a technique which can be applied in practically every heat-using establishment, large or small.

The general idea



CAN BECOME



A—Boiler House. B—Power Plant. C—Process Plant. D—Space Heating.

This may appear a simplification of the problem, but the scheme—to get still more work from your heat supply—is capable of universal application.

What about results?

Here is an actual case taken from Ministry of Fuel records.

A works used 70 tons of coal per week to generate steam at 150 p.s.i. to drive a reciprocating engine coupled to a D.C. Generator and to supply steam through reducing valves for process and space heating.

The engine was converted to back pressure working and the exhaust steam at 15 p.s.i. supplied the whole of the needs of process and space heating.

Saving 25 tons of coal per week—36% of fuel bill.

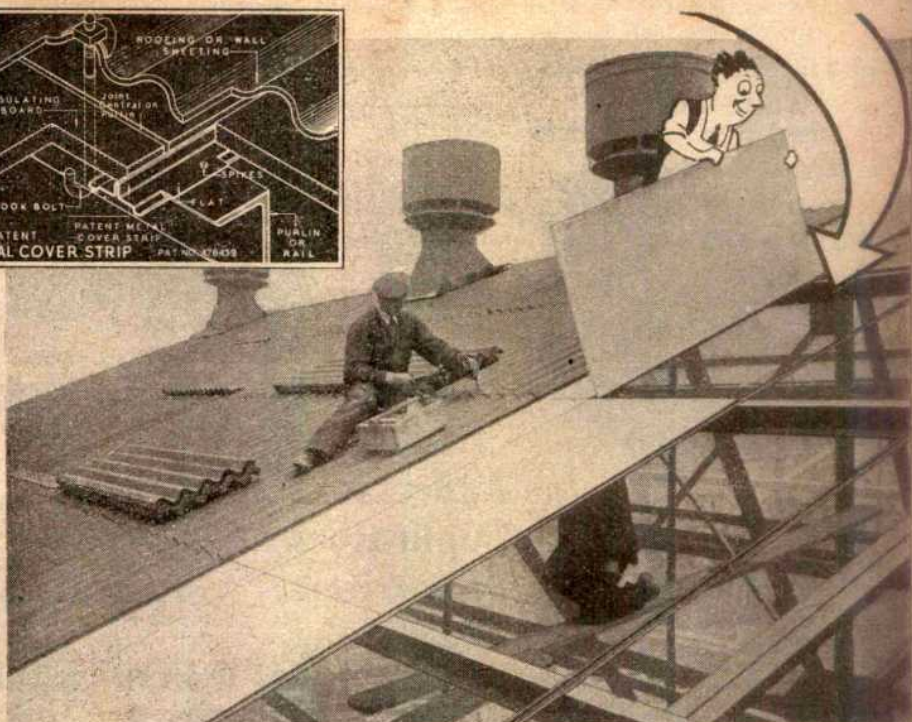
This modern technique of THERMAL LINKAGE is a sound business proposition. It should be regarded as a fundamental factor in any scheme of reconstruction or conversion of plant.

Your Regional Office of the Ministry of Fuel will provide expert guidance.



ISSUED BY THE MINISTRY OF FUEL AND POWER

— says George



TENTEST FIBRE BOARD Co. Ltd.
75 Crescent West, Hadley Wood,

COUPON

Type of building

TAYLORS FOR ALL TYPEWRITERS

Adding Machines, Duplicators, Cash Registers, Calculators, Time Recorders,
and All Business Appliances BOUGHT AND SOLD, HIRED AND REPAIRED

SAVE TIME — HIRE AN ADDER FOR STOCKTAKING

ADDOGRAPH

The Simplest Portable Adding, Listing
Machine.
Delightful to use.



8 col. to add from 1d. to £9,999 19s. 11½d.
9 col. to add from 1d. to £99,999 19s. 11½d.
Hand and electric models with or without
subtraction and wide paper carriages.
No modern Office can afford to be
without one.

**NO MORE ERRORS—JUST USE THE
GUARANTEED ADDOMETER**

Rapid Automatic Addition & Subtraction.
Rests flat on the books. For Decimal or
Ordinary Figures and Feet and Inches, etc.

FOR POCKET OR DESK.
So Simple Anyone can use it.

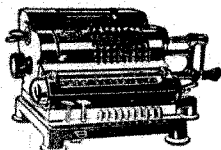


In Plush-lined, ducoid case.
Size, 11½ × 2½ × 1 in., £4 15s.

MONEY MODEL

Adds to £9,999 19s. 11½d. Price £6 6s.
When ordering state for what purpose
required. Also a cheaper pocket Adder for
ordinary figures and Indian money, in
case, 30/- post free.

**ROTARY CALCULATORS
ALL MAKES**



For all calculations. Multiply, divide,
add and subtract in 1/10th time taken
to do so mentally.

HIGHEST PRICES

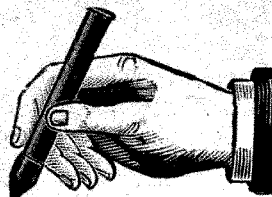
PAID for all
Makes of Modern

**Office
Machinery:
Adders,
Calculators,
Cashiers,
Addressers,
Duplicators,
Typewriters,
Steel Safes
& Furniture**

**URGENTLY
WANTED
FOR
NATIONAL
SERVICE**

Turn your
**SURPLUS
OFFICE
EQUIPMENT
INTO CASH**
and help the
War Effort

THE ALL-RUBBER DAMPER
gives squeeze control of moisture.

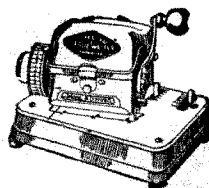


THE TAPPIT ALL-RUBBER DAMPER.

Ever Ready and Hygienic.
A squeeze controls feed of moisture.
2/- post free.

**A FEW
VISIBLE INDEX
SYSTEMS
FOR SALE**

**SAFES,
DESKS,
CHAIRS
& TABLES**



**ELIMINATE LOSS AND FRAUD BY
USING A "SAFEGUARD," THE BEST
CHEQUE PROTECTOR**

Used by leading Banks and firms. Do you
realise that an altered cheque is your
own liability? Price £12 12s.

All makes of Cheque Writers at
bargain prices.

Phone: Holborn 3793, or write

TAYLORS TYPEWRITER MARKET

74 CHANCERY LANE (Holborn End),
& at Maidenhead. London, W.C.2

A Handy Size-

the **NEW 4 FOOT
METROVICK
FLUORESCENT LAMP**

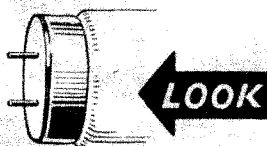
in **DAYLIGHT**



The Bi-pin Cap ensures **SAFETY FROM SHOCK** as all accessible parts are insulated
It also means that—

- (1) Holders are rigidly fixed.
- (2) The insertion of the lamp is a very simple matter as it is only necessary to slip the pins into the slot of the holder and turn the lamp through 90 degrees.

This can be done by one man in one operation.



METROPOLITAN-VICKERS ELECTRICAL CO. LTD.
NUMBER ONE KINGSWAY . . . LONDON . W. C. 2.

ONE *SIZE*
ONE *SHAPE*



SIZE OF FUEL $1\frac{3}{4}$ " Lg. x $1\frac{1}{4}$ " Wd.
 REGD. DESIGNS 838903-825610

PHURNACITE

SMOKELESS FUEL

RECOMMENDED BY THE MAKERS BOTH OF "ESSE" COOKERS
 AND OF "AGA" COOKERS AND WATER HEATERS

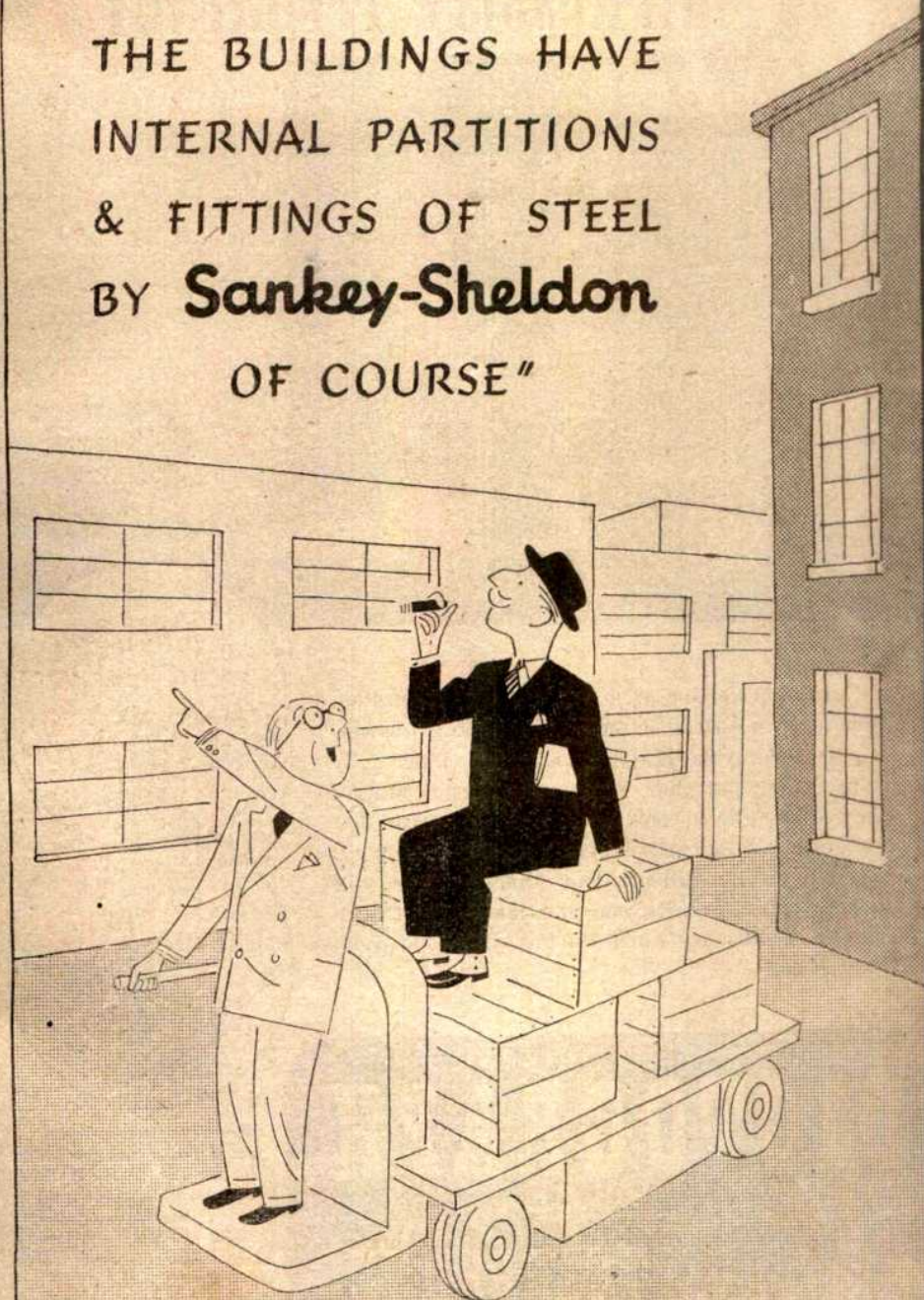
PHURNACITE never varies in size or quality.
 You can always identify the genuine product by its
 unique shape, bearing the two recessed bands, as
 illustrated.

Coal Merchants are doing everything possible
 to ensure fair distribution of the limited supplies
 of Phurnacite.



A POWELL DUFFRYN PRODUCT

"OUR NEW PLANT. ALL
THE BUILDINGS HAVE
INTERNAL PARTITIONS
& FITTINGS OF STEEL
BY **Sankey-Sheldon**
OF COURSE"



IMPRESSIVE EFFICIENCY



You are interviewing a client. He asks a question which only a specialist on your staff can answer. No need for anyone else to come to your office. By lifting a key on your Dictograph Master Station you are in desk to desk talking contact with that specialist and the information your client seeks is instantly given, without fear that another will interrupt your priority conversation. Is not such impressive efficiency worth the few shillings a week which it costs?



DICTOGRAPH

The real thing in
★ INTERNAL TELEPHONES

Also recommended: Dictograph Sound Installations for providing "Music While they Work", Emergency Alarms, and Stop and Start Work Signals combined with Time Recording and Job Costing Facilities.

INCREASED SPEED
ACCURACY
AND ECONOMY
with
ALACRA
CONTINUOUS
STATIONERY

It's Performance that Counts

Practically all Continuous forms are divided into distinct types. Friction Feed and Positive Feed. Alacra Continuous forms are fed through the Registrar, Typewriter, or Accounting machines by Positive feed—without friction—by the marginally punched holes that engage with the Pinwheel Platen; giving perfect register and alignment to all copies.

Alacra Continuous forms can be used in every sphere where written records are required, and the result and saving in time and money is considerable when total record costs are taken into consideration.

Alacra Business Systems have studied and can interpret the difference in terms of Performance and Lower Finished Form Cost.

The services of our Consultants are at your disposal.

W. H. SMITH & SON, LTD.

BUSINESS FORMS DEPARTMENT
BRIDGE HOUSE, LAMBETH, LONDON, S.E.1

Telephone: HOLborn 4343.

Telegrams: Bookstalls, Estrand, London

Head Office: STRAND HOUSE, PORTUGAL STREET, LONDON, W.C.2

LIGHT

*can revitalise
your business*

Electric lighting, properly planned, is the shopkeeper's best draw. Light attracts customers, pleases them and helps you to sell. To assist in a better understanding of the value of good lighting, the Lighting Service Bureau has produced *Light—the Sales Builder*, a most useful publication with ideas for large or small shops.

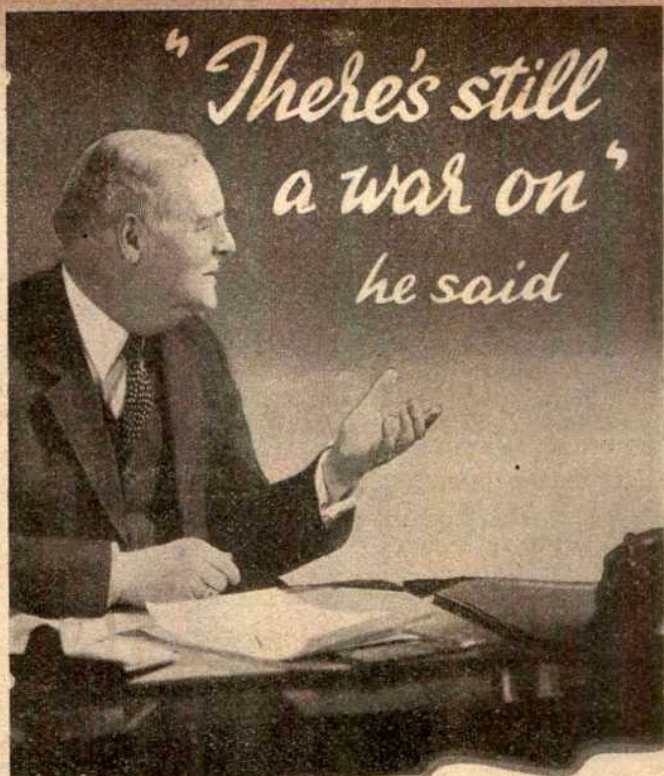
Special lighting for displays, for general lighting and for showcases—in fact, recommendations for practically every type of business are dealt with in *Light—the Sales Builder*.

The diagrams and hints will be of the utmost interest *now* and in preparation for the time when shop window lighting and unrestricted shop lighting are once again permitted.



Write at once for your free copy.

THE LIGHTING SERVICE BUREAU, 2 SAVOY HILL, LONDON, W.C.2
MAINTAINED BY THE ELECTRIC LAMP MANUFACTURERS' ASSOCIATION



"There's still a war on," he said. "A war on all the time—against a thousand-and-one things; and, not least of all against the natural laziness of man which tends to leave things to chance and let them take their course."

"You have seen the biggest war of all time won on planning. That same planning is essential to *your* business if you want the same assurance of success."

"You've heard of Pluto?" he suddenly demanded.

"Of course, I've heard of Pluto," I said, "The amazing pipe-line that carried . . ."

"Exactly! . . . that carried the life-blood far and wide to the engines of war."

"Well, have you ever thought that *your* organization is a miniature Pluto?"

I'm afraid I looked at him rather blankly.

"Think of it this way," he suggested. "Your Production is a pipe-line through which you must keep uninterrupted flow, watching and checking for kinks and leaks and stoppages."

Your Sales flow is another pipe—more intricate this time. For, whilst your Production flow is in your factory, there under your eyes to watch over and control, the sales flow is an underground pipe coming only to the surface at distant points throughout the country.

"It's no easy matter, you'll appreciate, to find leaks in an underground pipe. It needs planning and control. And, mind you, a sudden burst of energy and a sales boost won't put wrong sales-figures right. Applying pressure to a leaky pipe only increases the loss . . ."

A clever analogy, I thought; and I'll tell you that, by the time that fellow had finished talking, he'd made me think quite a lot . . .

Booklet by
A. R. JACKSON

PLANNED SELLING

Has this got your interest sufficiently to want to know all he said? Send 1/- for the booklet mentioned herein. It will be the best disbursement of petty cash your business ever made. Send to Dept. B3

PRODUCTION • SALES



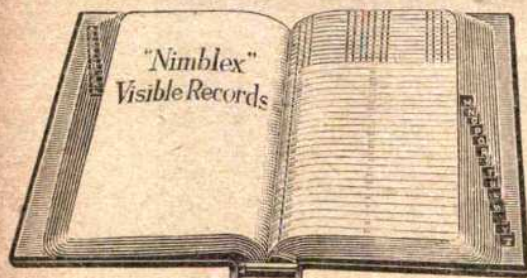
STOCK CONTROL

KARDEX VISIBLE CONTROL SYSTEMS, 1-19 NEW OXFORD STREET, LONDON, W.C. 1

Tel.: CHAncery 8888

Division of Remington Rand Ltd.

Look at your Records



—not for them

Consider the time taken by your clerks in looking for records of Buying, Selling, Stores, Components, Progress, Costs, Plant, etc. You need information at once. Do you get it? The **Nimblex Visible**

Loose-leaf Book puts an end to *recording and finding* problems. The details are *right in sight*. You see the titles of 25 records at a glance without turning over pages that you do not want. The Binder is operated with the greatest ease; it is light and durable and the cost is low.

Ask for *FREE* Copy of Leaflet No. 1001B

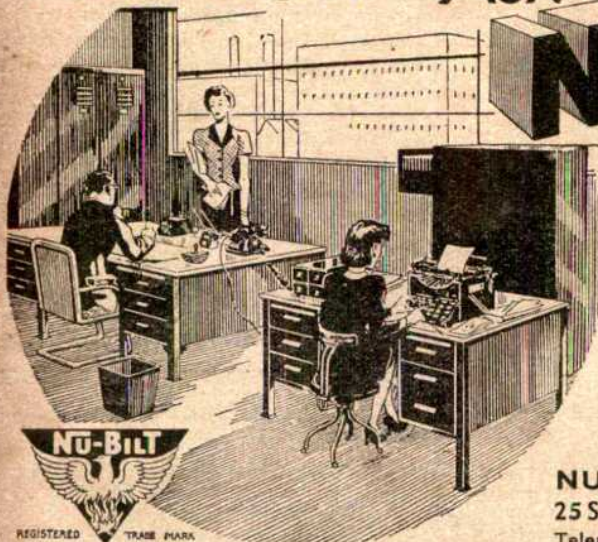
MOORE'S MODERN METHODS LTD.,

19-21, Farringdon Street, LONDON, E.C. 4.

Branches at: BIRMINGHAM EDINBURGH GLASGOW MANCHESTER

PLAN NOW — Ask

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**TYPEWRITERS
OFFICE & INDUSTRIAL
STEEL FURNISHING
& EQUIPMENT**

Enquiries placed now will have priority when restrictions are removed.

NU-BILT TYPEWRITERS LTD.
25 Southampton Row, London, W.C.1
Telephone - - HOLborn 5784/8856



A FAMILY 16 MILLION STRONG

*Study them carefully—they are the
“younger generation” of today, but
masters in the world of tomorrow*

THE war years have passed, and almost overnight a new generation has sprung up — the under 35's, the young men and women of Britain, courageous, battle-scarred, ambitious to build the world of tomorrow. They are a big family, this “younger generation” — over 16 million strong. They are the producers and the wage-earners, the future capital wealth of Britain in the vital years to come.

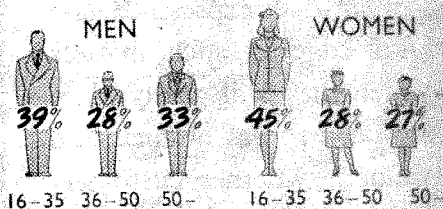
To understand their ideals, their problems, to look at things from their point of view, is to see the shape of the world of tomorrow. What this “younger generation” thinks and feels today will determine the fundamental pattern of all our lives in the years ahead.

But, what are the ideals, the problems, the interests of this all-powerful group of citizens? An exact reflection of their present and their developing viewpoint can be seen every day in the pages of the newspaper which is read by a greater proportion of the under 35's than any other national paper — the Daily Mirror. To be the voice and the sounding-board of the “younger generation” has long been the editorial policy of the Mirror. This policy has reaped success, for of its

2,400,000 readers, more than 42% are men and women under 35.

Thus, businesses whose well-being depends on the goodwill of the future buyers of Britain cannot do better than address their sales-messages direct to the “younger generation” — in the columns of their own newspaper, the Daily Mirror.

WHO READS THE DAILY MIRROR? WHAT ARE THEIR AGES?



DAILY MIRROR

Net sale in excess of 2,400,000—second largest in the world

HOME AGAIN—

Since 1939 large numbers of our men and women have been serving their country in the Forces.

Soon many of them will be returning to their homes, anxious to make a place for themselves in the life of a nation pursuing the arts of peace.

Constructive help will be needed in solving the many business problems that will confront them after long absence from the ordinary affairs of daily life.

The Managers of the branches of the Midland Bank have a wealth of experience and knowledge in such matters which they will gladly place at the disposal of men and women—whether customers of the Bank or not—upon their return to civilian life.

MIDLAND BANK
LIMITED

Biro

**MARKS A TURNING POINT
IN THE HISTORY OF**

Writing



**RETAIL
PRICE
55/-
including
purchase
tax.**

"BIRO" is unique: it writes with a ball-bearing point—a point that never goes wrong, never floods, bends or splutters—a point that rolls your writing on to the paper with effortless ease. "BIRO" ink dries as you write; you cannot smudge it; you need no blotter.

"BIRO" writes six months or more without refilling—according to the amount you write. To replenish "BIRO" for a similar period of trouble-free service, a refill unit is inserted while you wait.

The demand for "BIRO" has far exceeded production capacity. Consequently you may have to be patient until your turn comes round.

Wholesale Distributors:

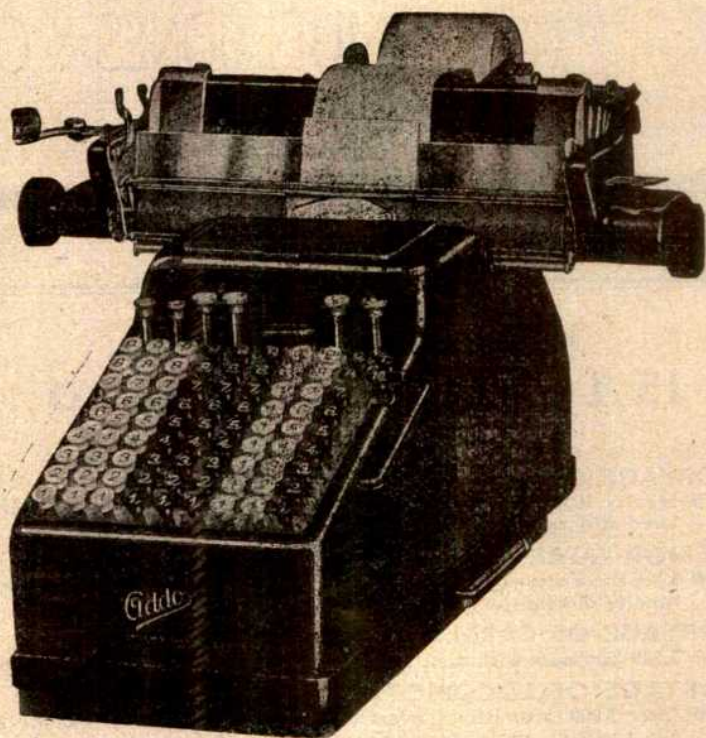
SIR HENRY LUNN LTD.
COMMERCIAL DEPT., 15 KING ST., ST. JAMES'S
LONDON, S.W.1.

ADD O

ADDING LISTING MACHINES

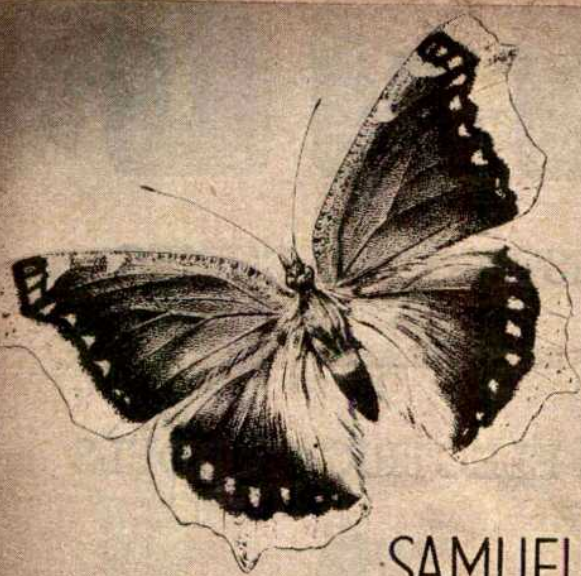
ARE AGAIN AVAILABLE IN

HAND AND ELECTRIC MODELS



Factory : CIRENCESTER, England.

Sole Distributors
BULMER'S **7/8 POULTRY**
LONDON. E.C.2.
Phone CEN 3611



EVERYTHING
COATED
EVERYTHING
GUMMED

SAMUEL JONES & CO. LTD

CAMBERWELL BEAUTY
Regd. Trade Mark

16-17 NEW BRIDGE STREET, E.C.4
TELEPHONE CENTRAL 6500

IF YOUR TRAIN IS LATE OR CROWDED

it is probably due to

SHORTAGE OF TRAINED STAFF

- Nearly 100,000 skilled railwaymen—a sixth of the whole staff—have still to be demobilised

INFERIOR COAL

- Like the housewife, the Railways are obliged to use coal of inferior quality during the national fuel shortage

SHORTAGE OF CARRIAGES

- 3,500 carriages with their 180,000 seats are away every day for repair

SHORTAGE OF LOCOMOTIVES

- Over 3,000 locomotives, overworked during six years of war service, are awaiting or undergoing repair every day

TO RESTORE PRE-WAR STANDARDS
WILL TAKE TIME

GWR · LMS · LNER · SR



"Should we agree to their terms?"

PROFESSIONAL and business men have a point in common; they frequently need to make swift decisions which must be based on the most accurate information. To do this effectively, immediate speaking contact between executives and staff, with facility for documents, files and other information to be consulted whilst conversations are in progress, is a necessity. A.T.M. Inter-communication Telephones provide this service to perfection and are obtainable for a very moderate rental charge. Write or telephone our nearest branch for details and rates.

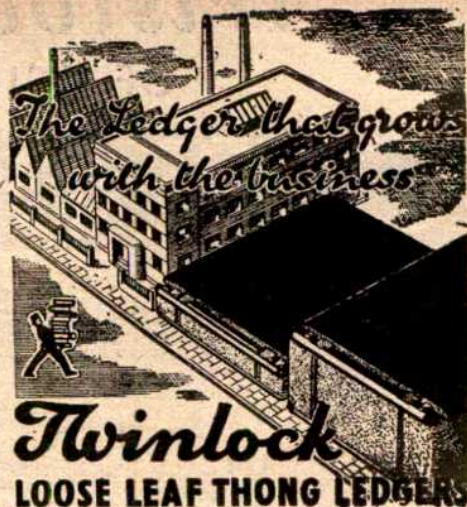


INTER-COMMUNICATION
TELEPHONES
OBTAINABLE ON RENTAL

AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.
MELBOURNE HOUSE, ALDWYCH, LONDON, W.C.2
Temple Bar 4506

STROWGER WORKS, LIVERPOOL, 7
Main Branches:—Manchester, Leeds, Birmingham, Bristol, Glasgow.
Also at:—Aberdeen, Belfast, Blackburn, Cardiff, Dublin, Dumfries,
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Nottingham, Plymouth, Rhyl, Sheffield, Southampton, Stoke-on-Trent and
Swansea.

A1202/3-CVI



YOUR FIGURE FACTORY

Your counting house is your figure factory. As your business grows so does a Twinlock Thong Ledger. Old customers buy again, new customers are gained. All this means more sheets in the ledger.

Twinlock Thong Ledgers are built to endure severe wear in a busy office. They will grow with your business.

Twinlock
SYSTEMS

SALES & PURCHASE • P.A.Y.E. WAGES
INVOICING • DAY BOOK • ANALYSIS
COSTING • STORES CONTROL • CASH
RECEIPTING • CASH PAYMENTS
MACHINE ACCOUNTING EQUIPMENT

You can help yourself to our services and experience in three ways:—

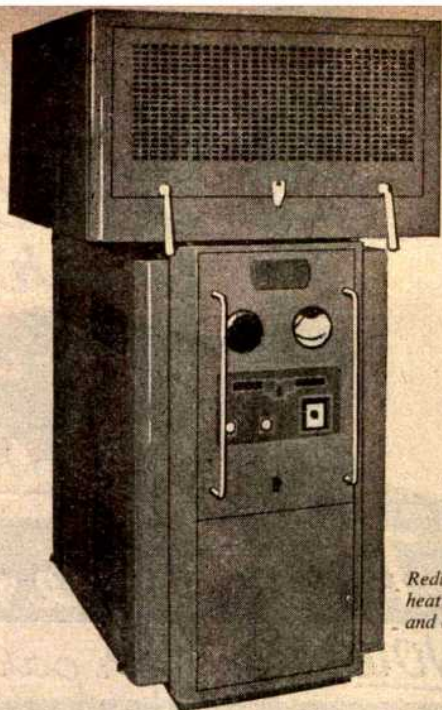
- Ask your stationer or printer to show you our line.
- Write to us direct to come and see you.
- Visit our showrooms.

IF IT'S LOOSE LEAF
THINK OF

Twinlock

PERCY JONES (Twinlock) LTD.
37, CHANCERY LANE, LONDON, W.C.2.

Showrooms: London Chancery 8971	Manchester 17, Chapel Walks, Cross Street Blackfriars 9459
Glasgow 20 Renfrew Street Douglas 4974	Leeds 69 Albon Street Leeds 25972



Redifon Model R.H.7, complete with heating chamber for plastics, rubber and other industries.

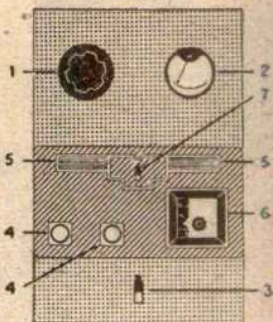
Radio Heaters available now for Increased Industrial Production

CUTS in production time can be achieved in a very large range of industries by the use of radio heating. And Rediffusion Ltd. are in a position to supply Redifon radio heaters now, particularly within the British Empire.

Radio heating can show immense savings in production time and costs in the plastics, wood, rubber, clay, textile, metal and chemical industries, to mention only a few.

A typical Redifon radio heater is the R.H.7. With an output of 2 kilowatts, this generator can plasticize average wood-filled phenolic moulding-powder or preforms *all the way through* at a rate of over 1 lb. per minute. Water can be evaporated from chemicals or textiles at a rate of 6 lbs. per hour. Hardening or tempering of small steel articles can also be carried out.

All Redifon radio heaters are absolutely safe for use by unskilled operatives. The advice of Redifon Industrial Electronics Division is always available to manufacturers who require advice on the best use of radio heating.



Redifon Model R.H.7. controls are compact and simple. (1) Power control (2) Output meter (3) Main switch (4) Control press-buttons (5) Warning lights (6) Timing control (7) "Manual" or "Automatic" control.

REDIFFUSION LTD.

*Designers and Manufacturers of Radio Communication
and Industrial Electronic Equipment*

SUBSIDIARY OF BROADCAST RELAY SERVICE LIMITED

CARLTON HOUSE, REGENT STREET, LONDON, S.W.1



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having any
printing
worries?

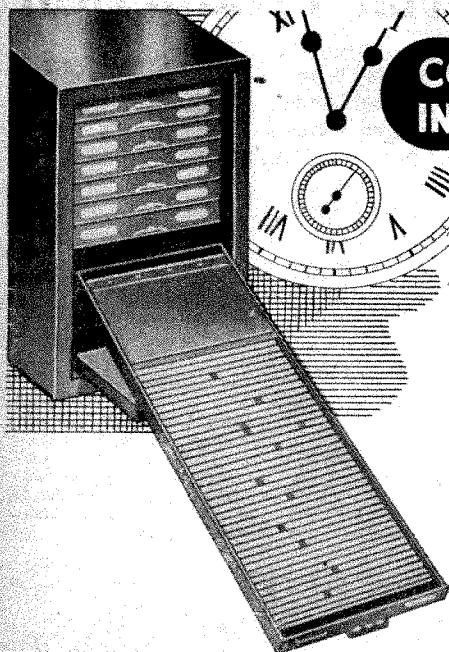
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BRITISH **Rotaprint**

And Save Time-Trouble & Money

Available NOW - apply for particulars-

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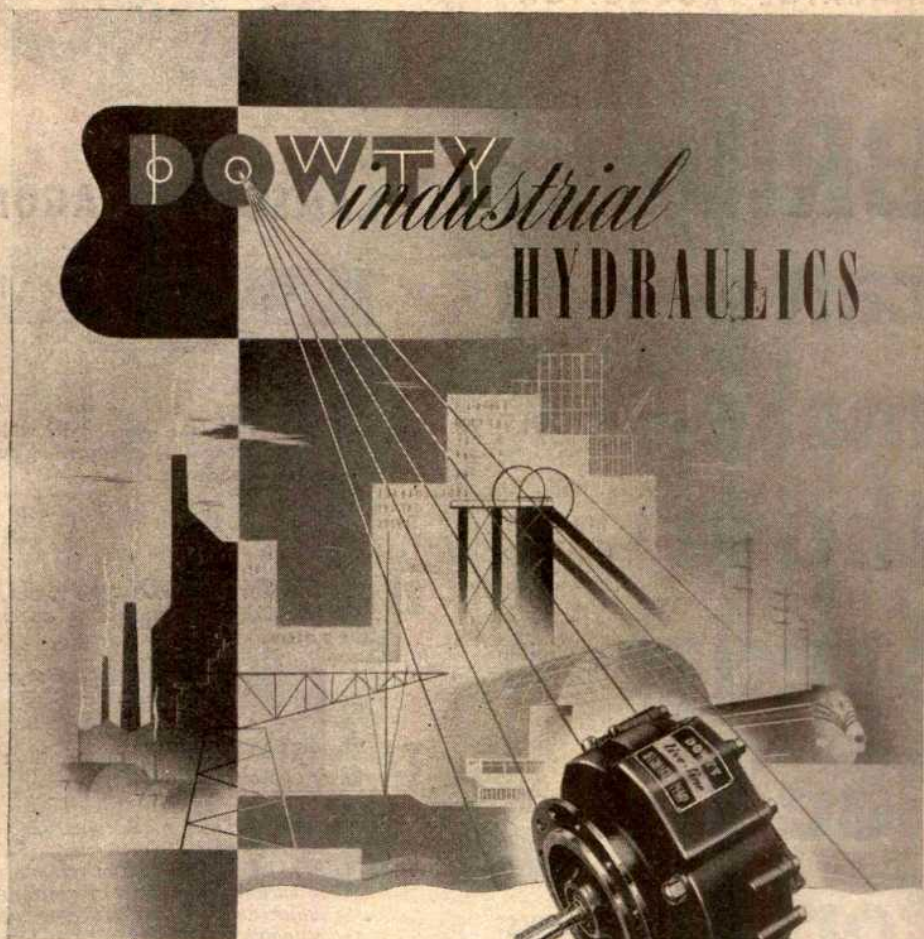
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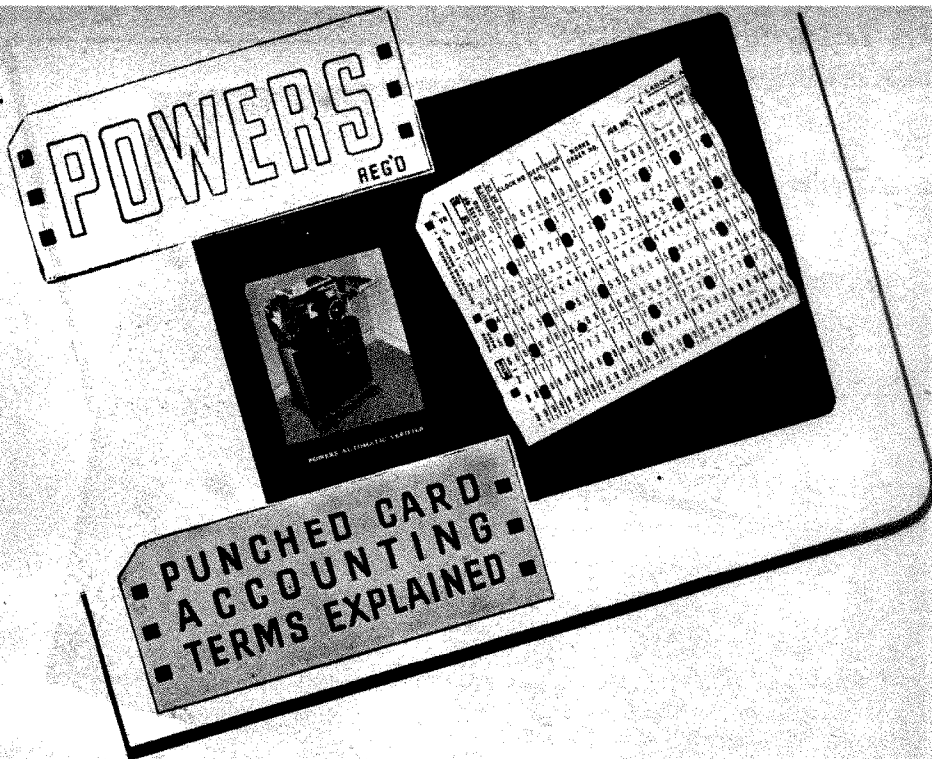
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BUSINESS

MARCH

Vol. LXXVI.



1946

No. 3

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A NEW industry valued at £65 million, prospects of trade with Czechoslovakia, Mary Channell's experiment in rural industrialisation, Jack & Heintz's P.M.H. methods, "Guy Motors" achievement in reconversion—our leading features this month tell an exciting, cheerful story.

AND BUSINESS tells you how methods, for building up a sales team, for starting a factory surgery, for combating another industrial disease; new techniques in job rating, speeding up office routine, improving P.A.Y.E., cutting export costs, can be put in hand immediately.

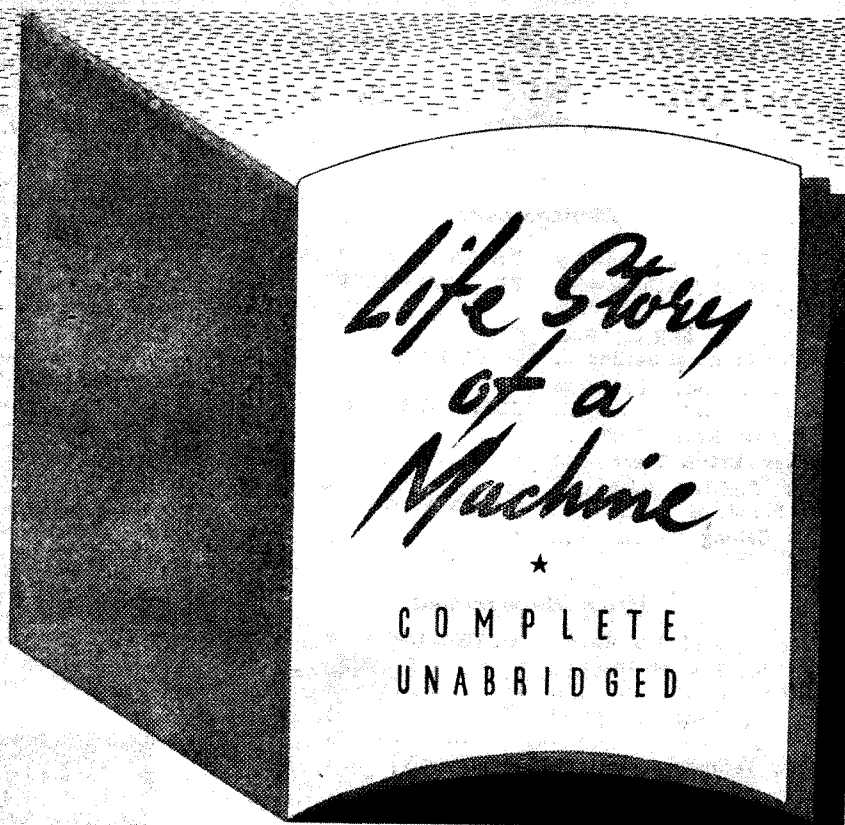
IN April, we introduce you to another colourful and leading industrial personality operating in a novel field—popular sport. P.M.H., of course, we shall tell in pictures. Reconversion, this time, the efforts of the men behind the textile machinery industry. Together with these will appear the usual features which can contribute to raising output and allround living standards—better lighting, better handling methods, better conditions, better health and sound inner-man administration in the canteen.

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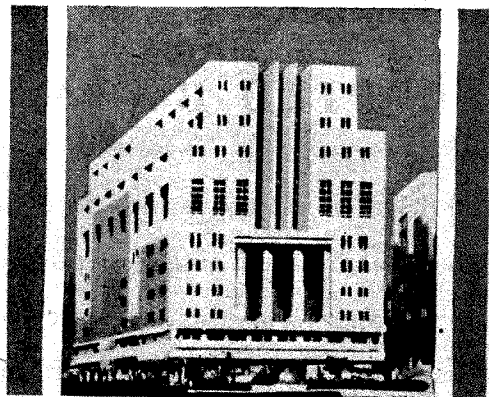
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(Clock and Watch)

Industry

By
BRIAN CUMMINGS



IT used to be a characteristic of British industrialists that they put good ideas into their products, developed them to a state of perfection, and then allowed other people to exploit those ideas by using them in mass-produced, and often second-rate articles.

Typical of the industries in which this lamentable process took place has been the watch and clock industry. In the 17th and 18th centuries clock making was mainly centred in England. The opening of this century found the consumption of clocks in this country enormously increased. It also found us meeting nearly all our needs by import.

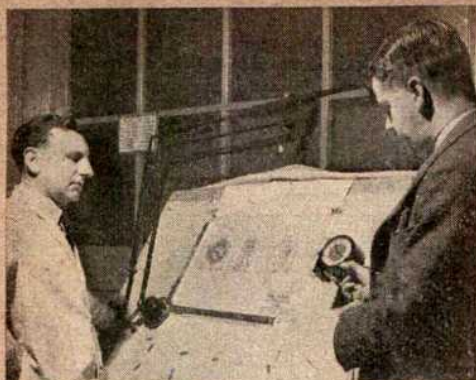
England began to lose her place as the foremost clock and watch manufacturing country in 1750. The old craftsmen felt that good watches and clocks could only be made by hand, that it would be sacrilege to use the new-fangled machines that were just being invented. It did not occur to anybody to try and break down their prejudices, or improve the machines.

The re-birth of the industry really took place

in 1930. It was a painful business. British watch and clock manufacturers had to face intensive competition from the subsidised German watch and clock industry, and from American factories. Even before World War 1 a German kitchen clock was freely sold retail in England for a few shillings.

The Germans subsidised their watch and clock industry between the wars because they realised that well-equipped watch and clock factories would be invaluable for war purposes. The skills and factory facilities needed for successful horology can readily be turned to the manufacture of instruments for aircraft, tanks, and ships.

British watch and clock manufacturers do not intend to be caught like this again. They did a superb job during World War 1 and World War 2. They, too, made instruments for aircraft, tanks, and ships, as well as fuses and shells. They did more; they made great numbers of intricate machines with which to manufacture the instruments.



Draughtsman and engineer with a new 24 hour fully automatic electric alarm and sectional drawing, discussing points of production

The latter achievement only took place in the 1939-45 war. It was occasioned by the fall of France, which cut off the supply of tiny cutters needed to produce small clock components. The cutters had to be improvised, and one firm was so successful in doing this that it is now able to help other manufacturers who have been seriously handicapped by lack of precision tools.

Though members of the general public might be forgiven for thinking so, the horologists did not stop making clocks and watches between 1939 and 1945, either. They made them in every conceivable form—for aircraft, marine and factory purposes, stop watches for the three Service Ministries, and pocket watches for Army use. As the war ended, they had just started to make wristlet watches for pilots and navigators.

Is all this wealth of experience going to waste? Is a British industry once more going to allow its ideas and methods—forged, in this case, in the heat of war—to be exploited by others? "Not on your life," say the clock and watch manufacturers. They have discovered their mistake, and are not going to make it again.

Nevertheless, it should be recognised that they are in a topsy-turvy position. In 1930 British horologists were beginning to restore their industry on a large scale. No sooner had they started than they had to turn to war production, to the manufacture of automatic pilots, artificial horizons, averaging sextants, sensitive altimeters, turn and bank indicators, compasses, sextants, chronometers, echo-sounders, mine mechanisms, detonators, and a dozen other engines of war.

Now they must switch back production again, base their methods on experience which—paradoxically—has been gained more in war than in peace. But they go forward confidently, zestfully. Mr. D. W. Barrett, managing director of

a famous company of watch and clock makers, told me:

"We are going to make all forms of clocks. This country used to import an average of nearly three million alarm clocks per year. We shall make all those for ourselves, plus quite a large surplus for export. Collectively, by the end of 1947, British manufacturers of alarms should be producing between five and six million a year. It would appear that we will have at least three million for export purposes."

While Mr. Barrett is confident that the clock industry can be switched over quickly and effectively to large-scale production, he regards the mass production of watches in this country as a more difficult problem. But he has ideas for its solution.

"We won't be able to tackle it the same way as the Swiss," he says. "We shall not be able to wait for our people to be trained in schools of horology, as are the Swiss youths and girls. We have got to get ahead straight away."

"I think we shall win through by sheer mechanisation. Every operation which previously needed a skilled operator will be done with the aid of ingenious machinery, which we shall develop bit by bit as the problems arise."

"In any case to commence with, concentration will be on the more popular grades of watches, which represented the bulk of our imports before the war. It is estimated that of the eight million watches we imported annually, about seven-and-a-half came under the heading of the popular type."

Even Components for Export

Mr. Barrett is confident that the problem of the production of the special ferrous and non-ferrous metals required for watch-making has been mastered; also the production of such special parts as hair springs, which are already being made in very great volume here, and are being exported to most countries in the world, including America and Russia.

Escapements, which are the heart of the clock and were imported until 1929, are now manufactured at home. The production of main springs for watches and clocks, especially for very high grade watch types, has been receiving a very great deal of attention. Quite large sums have been spent on research. Synthetic rubies for use in the movements have also been made, and they are of very fine quality.

Developments in the field of electronics will make even the cheapest watch a first-class time-keeper. Testing and timing is no longer a tedious job extending over a period of weeks. The time is not far distant when it will be done instantaneously.

Before the war, Britain was becoming electric clock minded. The instruments were becoming widely used in the domestic and commercial worlds, and British-made clocks were being

sold in many countries of the world. It is encouraging to note that this type of horology, too, is being developed—that synchronous electric types will be made as alarms, time-pieces, strikes and chimes, and in a wide range of commercial models.

One peculiarity of the switch-over of the watch and clock industry has already been mentioned. Its other immediate problems are typical of those facing the majority of British industries.

Many watch and clock factories were dispersed for security reasons during the war. The people who worked in them lived in unsatisfactory conditions. Now they are becoming restless. Houses must be built for them, so that they can enjoy some kind of security and home life.

That introduces the problem of the shortage of labour itself. Probably no factory in the watch and clock industry has more than five-eighths of the labour it needs. The consequence is that overheads are increased, and prices are high. Consumers are aware of this, but even so not all the high costs are being passed on to the public.

The vital fact which the industry has to recognise—and in most cases is recognising—is that it has about two years in which to solve its problems and prepare to meet foreign competition on a level basis in all markets of the world. That raises the problem of P.M.H., a subject which is receiving month by month attention in *BUSINESS*, and is dealt with elsewhere in this issue.

I must not cut into the field of P.M.H., therefore, but a remark of Mr. Barrett's connected with this subject must be put on record. "I believe that food plays an important part in the ability of our workpeople to work long hours at high pressure," he told me.

"For this reason I am a little alarmed at the food cuts, although they are being made for humanitarian reasons. The Americans are better able to work long hours at high pressure because they have got more and a greater variety of food—they are better charged than our people.

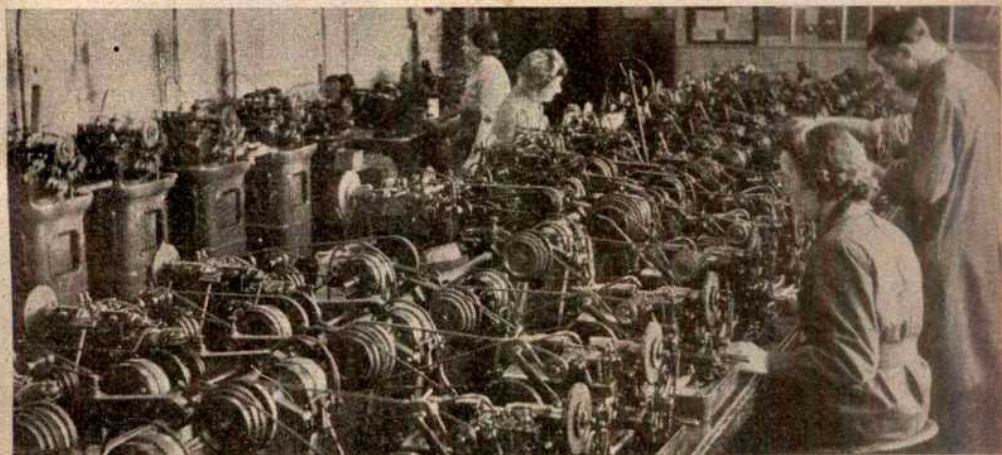
"I believe there is a lot in the idea that if we are to get greater output per man hour, so far as that output will come from increased effort by the workpeople, then food will play a part. Without the right fuel you cannot expect the human machine to work at its best pressure."

It has been estimated that the British watch and clock industry is within sight of giving employment to 20,000 people, that in time it will absorb many more, that it will be worth something in the region of £65 million.

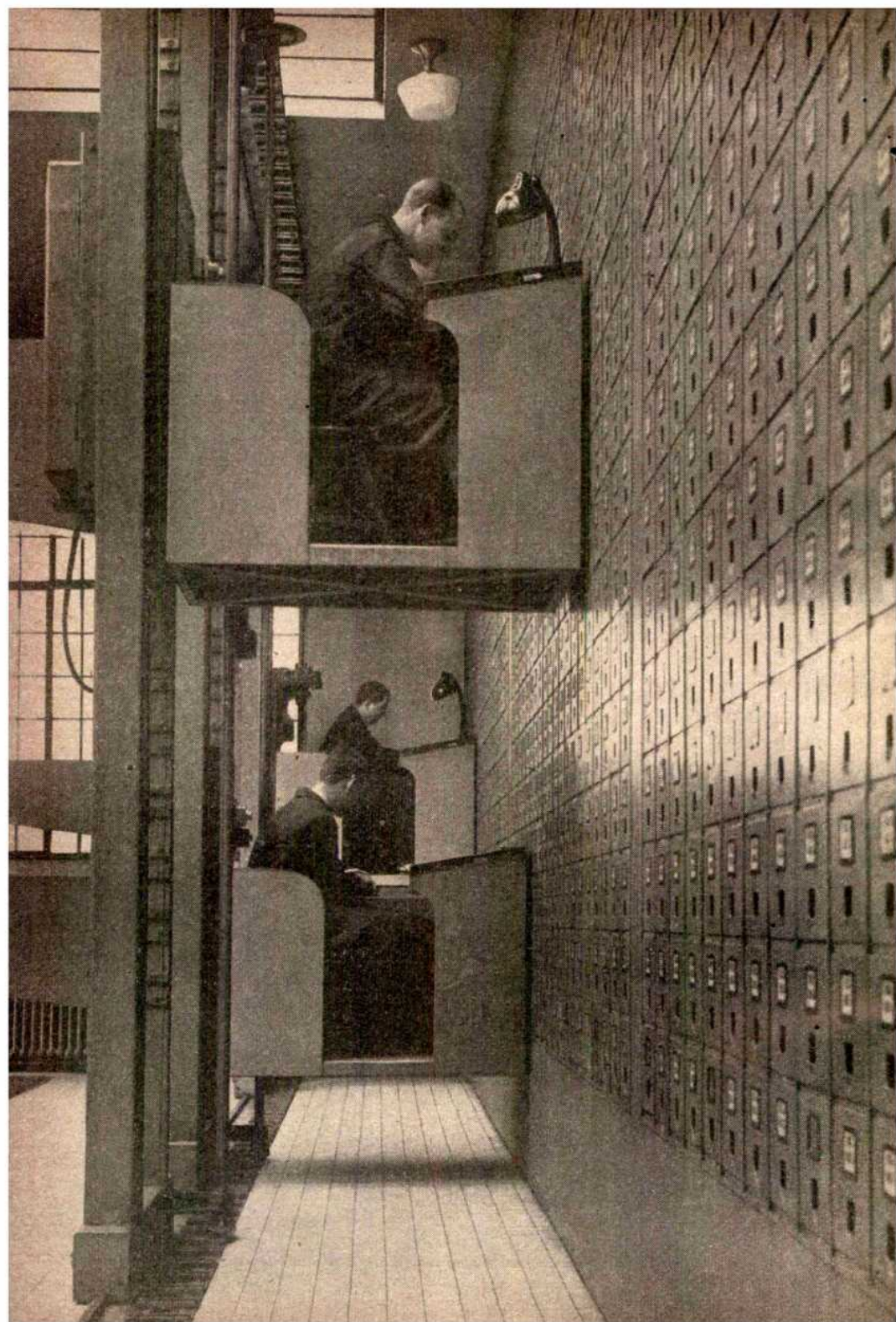
A factory at Cheltenham is already turning out high quality watches at a steadily increasing rate. Another in Lanarkshire is producing 1,000 alarms a day and by the end of the year production will have risen to 3,500. In Wales a new factory for popular-priced watches will be completed this month. It has a target for this year of 5,000 a week—and that figure will be dwarfed by next year's production.

All this is welcome news. It means our imports will be reduced, and some of the losses of our pre-war major exporting industries compensated for. The demand for British watches and clocks is colossal. There are orders from practically every country in the world.

The British watch and clock industry is rising energetically to meet this demand. From conversations with its leaders one cannot help feeling confident that they will meet all their problems, peculiar and complex as they are. Let us hope the horologists are typical of all British craftsmen in that they are putting their old skills into the new mould of mass production.



Women cutting wheels and pinions for clocks on small automatics with skilled setters in constant attention



Ernest Davies M.P. Tells "Business"

What He Saw In Czechoslovakia

IN the heart of Europe, bordered by Germany, Austria, Hungary, Poland and Russia, little Czechoslovakia is once more bravely striving towards political and economic independence.

Bereft of her richest industrial area at Munich in 1938, occupied by Germany in March, 1939, coal mines torn away by Poland, another large area taken by Hungary, split in two by the segregation of Slovakia, the country's disintegration appeared complete. But the Czechs and Slovaks are an independent people, and hardened by 300 years of struggle against the Hapsburg monarchy, they did not win their independence in 1918 to lose it again so soon.

They were determined that its loss in 1939 would be but temporary. So when the Russians advanced from the East, the Slovaks rose in their support and aided the liberation; when the Americans approached from the West the Czechs rose in Prague and hastened the final

The Czechs want British goods and we want theirs. What are the prospects for early trading? Returned from the scene, the author gives us the facts

overthrow of the Nazis who had been in their midst for more than seven years.

No country can go through such an ordeal without emerging physically damaged and economically weakened. Bridges were down on road and rail—in Slovakia 1,160 bridges of a complete length of 14 miles were destroyed—factories were bombed and shelled, the country devastated by fighting and robbed of goods, food and livestock by the fleeing enemy.

Worse still, during the occupation most of Czechoslovak industry had been Germanised; German owners and managers were in control and with defeat they fled, leaving the factories idle. On top of this came "revolution"; the workers seized the factories, but for constructive and not destructive reasons. If the country was to survive the destruction of war, and the degradation of occupation, production had to be got going again speedily and efficiently.

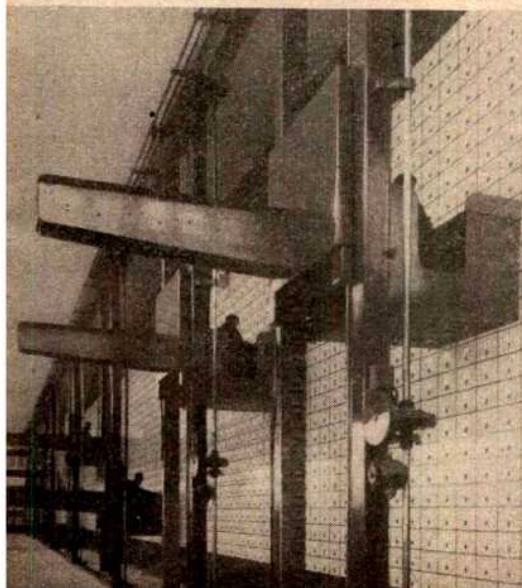
The workers took over, but without the skilled technicians, and faced with shortages of raw materials, of fuel, and with transport difficulties, their problems seemed insurmountable.

Soon however stable government, with all parties uniting in a National Front coalition, regularised the revolutionary situation. The Government nationalised the banks, and insurance companies, the mines and heavy industry, and much light industry. It appointed administrators in the factories and concentrated on economic reconstruction through production. And much progress has been made.

Before the war Czechoslovakia was roughly half industrial, half agriculture. She exported raw materials, coal, timber, machine tools and manufactured goods of which pottery and glassware were among the chief. She imported machine tools and manufactured goods and raw materials.

Germany was her largest customer, but Britain came next. A large trade was also

On left and below. Two views of the mechanised system which keeps the records of a nation. Headquarters and nerve-centre of the Czechoslovakian Social Security organisation





The grace of old Prague and the hope of youth. In the Wenzelsplatz a sorely tried generation plan to secure a happy future for the citizens of tomorrow



carried on with the U.S.A., Russia was far down the list. Like Britain, Czechoslovakia must export to live and the drive for production was a drive for the resumption of trade on a multilateral basis.

Already production is on the up-grade and trade is slowly being restored. As with Britain, production and trade is based on coal production, and, as with us, output is below requirements. Shortage of labour is common to both, but the cause for the manpower difficulties in Czechoslovakia is different.

Before the war much of Czechoslovakia's labour force consisted of German workers who constituted the minority within her borders which Hitler used to stir up the irredentist movement which led to Munich.

These Germans are now being transferred to their fatherland, and though for security and political reasons this is unavoidable it presents a grave economic problem not only in the mines but in all Czech industry.

In December, 1945, there were still 26,143

Germans working in the Bohemia mines and only 23,219 Czechs. The working morale of the German miners is very low and most of them will ultimately be transferred. Recruitment of youngsters, and the training of redundant workers from other industries, is taking place but shortage of labour must continue for some time.

There is also a chronic shortage of transport, particularly wagons and rolling stock, and much mining equipment was damaged and is in short supply. Nevertheless, coal production is up to 85% of the 1937 level. In December the Bohemia mines produced 1,441,280 tons of coal, which was about 12% less than the target. Although fuel is short and homes and hotels, schools and factories are often without heat, some coal is being exported in order to get the necessary raw materials for industry.

In December 16,372 tons were exported to the U.S. occupational forces, 11,099 tons to the Red Army, 4,264 to Bavaria, 1,633 to Switzerland and 7,620 to Austria. In exchange synthetic rubber, potash and chemical products are being imported from Germany.

When the lights are turned off at the electricity works while you are shaving, when your substitute coffee is cool because of the low gas pressure, and when you freeze in your offices because of shortage of coal, I suppose one should take comfort that one's sufferings enable more essential things to be brought into the country.

As I sat and sneezed in my cold hotel I did not share such feelings. But less coal for domestic home consumption and more for industry is demanded by the Government. The percentages were 40% for the former and 60% for the latter, and according to Government statisticians this has to be changed. They claim 250,000 industrial workers are unemployed through shortage of fuel for industry.

Recovery in steel production is progressing, but less so than in coal. It is up to 54% of pre-war; iron production is 31% of pre-war. In both coal and steel the percentages are superior to those of other liberated countries; for France the figures being 71% for coal and 20% for steel, and for Belgium 52% for coal and 22% for steel. Motor car production has got going again but was only 2% in number from liberation to December compared with pre-war; production of lorries was better, being 32% and of motor cycles 16%.

Most vehicles are being produced for gas generators, as in the case of the well known "Praga" three-ton lorry now once more in production. Skoda, much damaged, is in production again too.

Drastic Shortages

Incidentally the Praga Motor Works are assisting in the erection of the first motor works in Yugoslavia for the production of these vehicles under licence. Most cars on the streets have queer contraptions attached which carry or make the fuel as they run. There may be two cylinders of coal gas on the roof, or a stove in the rear attached, or trailing behind furiously burning coke and sizzling like a steam engine. I found it quite customary, on returning to a parked car to have to sit patiently freezing while the chauffeur stoked up the stove to get enough pressure to start.

Glass and pottery production is rising and soon both should be available for export. The huge Bata shoe works at Zlin in Moravia were badly damaged during the war, and it will be some time before there is full production again.

In Slovakia, where much timber is available, tens of thousands of units of furniture to our utility designs are being made for export to Britain. In the Coats factory at Bratislava I saw thread being spun from the artificial raw material locally manufactured from wood.

Czechoslovak industry covers a great variety of manufactures and some idea of its extent can be gathered from recently published figures regarding industrial concerns in Bohemia and Moravia. In these two provinces there are 17,918 concerns of various sizes with 956,973 employees. Of these 11,871 or 66.3% of the concerns employ under 20 employees, 5,776 or 34.2%, employ 20 to 500 workers with 569,336 employees, and 271 concerns or 1.5% employ

Please turn to page 102



Rivalling the best in Vienna in modernity.
Modern flats in Prague—Letna—built in
1935-38



In shopping centres as well—modern flats
rise beside the older structures



LOOK-OUT *for* NEW IDEAS.

● Seats On top. —

A device has been invented by a British surgeon which indicates the number of vacant seats on the top of a bus. It consists of a small dial carried on the conductor's platform which counts you as you go upstairs.

● **Revolutionary.**—The first experimental gas turbine engine for ships has been built in a Northern engineering works. It is likely to revolutionise design in sea transport because it is 25 per cent more efficient than other methods of propulsion now in use. One of the chief advantages of the gas turbine is that it eliminates boilers, thereby saving space and effecting many other economies.

● **Life-Saver.**—Spins, which result from the aircraft stalling and cause 90 per cent of aviation deaths, are said to be prevented by a new light aeroplane instrument developed in America. The device causes a warning horn to blow and a danger signal to light up when the plane is approaching stall position.

● **Airborne Telephones.**—The Home Office has perfected a new system of mobile radio-telephony operating on very short waves. Designed primarily for police cars patrolling in large county areas, it will enable aircraft to do without the Morse code and allow crew and passengers to be in radio-telephone contact at all times with terminal airports over routes of any length.

● **Rust Remover.**—A Los Angeles, U.S.A., firm is marketing a formula which dissolves rust of all types on iron and steel. It leaves a thin coating of chemical on the metal to check further oxidation.

● **Cheap at the Price.**—Plastic sponges costing £1, instead of the two, three or five guineas demanded for an ordinary sponge, are now on sale. When wet the plastic sponge is as soft and pliant as a rubber sponge, and can be used without getting clammy.

● **Cinders for Cinders.**—Britain, Cinderella of the export world, is to be assisted in her overseas trade by hats trimmed with iridescent painting and cinder blossoms. Models with these unusual characteristics are going to New York and the Dominions.

● **Process for Paper.**—A new groundwood bleaching process which, it is claimed, will expand newsprint and other paper manufacture is forecast by a Washington company. Groundwood has been used mainly for newsprint, but the company discovered recently how to bleach groundwood with a sodium peroxide solution which makes the paper suitable also for magazines, books, and mimeographing.

● **From the Sublime . . .** From China comes news of a new vehicle—the pedicab. Half rickshaw and half bicycle, it was introduced by the Japanese to assist the rickshaw pullers. There are two kinds of pedicab: in the pusher type you ride in front, in a reasonably comfortable seat; in the puller, you enjoy a view of the bicyclist pulling you through the streets.

● **. . . To the—?** And from America we hear of a new fighter plane which can carry a 6,400 lb. bomb load, or two one-ton torpedoes, act as an interceptor or attack plane, reach a service ceiling comparable to that of the Super Fortress, and attain more than 450 m.p.h. Another U.S. aircraft corporation announces the development of remote control for jet-propelled aeroplanes to a point where every function can be carried on by a distant operator receiving a constant check through a new transmitting device.

● **Clever Devils.**—Among German secrets discovered since V.E. Day are an invention which produces petrol from coal at 6d. to 9d. a gallon; methods for the production of synthetic butter, alcohol, aviation lubricants, soap, wool, rubber, rayon, steel, aluminium, plastics and paper. Some of the secrets are already available to British industry; others will follow.

● **Another Record.**—The United States claim another record. It is a typing speed of 180 words a minute, and it is achieved on a machine with a revised keyboard, the purpose of which is to shorten the distance travelled by the hands. On the new board vowels are placed on the left; consonants are so arranged that the right and left hands alternate.

● **We Could Use It.**—A new manufacturing process expected to revolutionise brick-making is being examined by the Australian Government authorities. It is said that the system will enable bricks to be produced at the rate of 10,000 a day by means of a mobile production unit working actually on the site of buildings and construction jobs.

Have You an 'Idea Spotter' ? Every Organisation Needs One

MARY CHANNELL PUTS

Industry In Rural Setting

Industry is watching Mrs. Mary Channel's experiment in rural industrialisation. It might transform ideas on costs, overheads, selling prices

By

R. W. HUNTER



LET us lift the latch of a bright green door set in the golden-brown brick wall of a thatched roof dwelling house in the old England village of Flore, Northamptonshire. Immediately opposite, in the back garden, is a small modern factory, one of the several scattered production units in the village where the zealous and happy community turned out parts for closely-guarded firebombs during the war.

The interior decoration scheme is a pale green chosen for its psychological effect on the workers, the bases of the machines now producing parts for electric kettles also being painted the same colour.

But despite the non-industrial atmosphere of the rural setting, efficiency reigns. The visitor to Erinex Ltd. must first be courteously escorted to the office telephone-receptionist. She extends a friendly welcome of a quality too seldom encountered at the reception desk of modern industrial enterprise, but at the same time, keeps an efficient eye on the recording of visitors.

Before opening the door of the office of the managing-director of Erinex Ltd.—Mrs. Mary Maxwell-Channel—the visitor should be prepared for striking contrasts. The room is furnished with antique and period furniture. A Stuart tapestry adorns one wall. On a period table is the scale model of the new factory about to be built with a workshop area of 30,000 sq. ft., and of the new housing estate for employees, comprising 32 houses which will be ultra modern in labour saving equipment, including electric washing machines, refrigerators, hot water supply from a central source, etc.

At another period table, seated on a high backed antique chair, is to be found the Company's Secretary, conducting business with the same despatch as is found in a city office. Nearby, under that same thatched roof, is the costing office where costs are accurately re-ported on a batch basis.

We found Mrs. Mary Maxwell-Channel, member of the Women's Engineering Society,

dressed in silver grey, seated at a small William and Mary table, mastering the details of a production problem needing her decision. From here this 20-year-old-managing-director conducts not only the business of Erinex Ltd., but that of two other companies as well.

Here, too, are made plans and decisions which range from the personal welfare of an employee to the sale of electric kettles in Sweden and U.S.A., and, although the new factory at Flore is yet to be built, to the establishment of a branch factory in Australia.

Foresaw a Labour Shortage

Industrialists, sociologists and women's rural institutes are watching Mary Channel. Focussed in this village of Flore is the centre of an experiment in rural industrialisation, which may effect throughout Britain a transformation of village life. How this may affect selling prices of industrial products yet remains to be seen for overhead costs in rental value and taxes and cost of living is naturally lower in village than in a city.

In war-time Mrs. Channel conducted successful experiments in business administration, and she is applying them in her peace-time enterprise of electric kettle manufacture. Charm she unquestionably possesses and her remarkable foresight is its equal. As far back as 1938 she advised certain top executives of large industries to commence training women in their plants to fill the inevitable skilled male shortage in the war which she foresaw must come.

When the national war demand for all out production came, Mary Channel, then a 23-year-old trained engineer, answered it by starting a small engineering enterprise in Flore. Previously she had been conducting a successful manufacturing business in luxury products.

Starting with one foot press, and a labour force consisting of a 16-year-old boy and three

local women whose sole engineering knowledge consisted of raking out the kitchen stove, and a general fitter, she commenced production. The machine age had arrived at Flore. Thatched roofs echoed to the melodious clank of metal against metal.

From so small a beginning she developed an organisation which produced over twenty million vital parts for the Ministry of Aircraft Production, including secret parts for the latest type of fire bombs. With the part-time services of local wives and widows the plant ran twenty-four hours a day.



Moments in her daily round. Top—in the planning department with works foreman. Centre—with chief inspector and operators in the assembly shop. And finally, a word with a girl in the machine shop

Several women among her 200 Geddington employees were over 60-years old, one 70-years-old, and one, incapable of walking but 100 per cent efficient at work, was brought to the plant on wet days in a bath chair.

A soldier's wife, whose productive value to the country on account of family commitments was sixpence an hour, learned how to work any machine in the factory, and as chief inspector and assistant in the wage make-up and book-keeping (which was done after hours) became her right hand woman.

Shoemaker's shop, wash house, barn, Salvation Army hut, old butcher's shop, an Old Priory at Geddington as assembly shop, a garage, all became part of the factory. A small modern factory of 2,400 sq. ft., housing nearly thirty modern machines, was constructed in the back garden of an early eighteenth century thatched dwelling.

This dwelling, with its antique and period furniture, housed the company's office and was Mary Channell's home. She ate and slept on the job!

M.O.L. said 'No' but . . .

Contracts were negotiated by her personally with the Ministry on a strictly impersonal, competitive fixed price basis. With lucid logic and feminine firmness the young engineer-executive convinced barnacled officialdom that, as records according to cost investigation requirements extended her valuable time away from the machines, production would suffer.

She obtained labour in villages where Ministry of Labour officials declared none existed. Here is a sample of her methods. Labour officials said there was no available labour in a community. An attractive poster was put up at the local post-office and the postmistress-shopkeeper promised half-a-crown for each woman registering for part-time employment. A few housewives were organised into a team to call at every house in the community and ascertain from every housewife what time she could give. And she got the labour.

Mary Channell trained most of her part-time employees personally. Each fully earned her wages in production. Throughout the war there was a waiting list for employment at her factories.

Many officials of other concerns came to Flore to see how the factory there was run. As news of the success of her efforts became known she was asked to address meetings in many parts of the country with a view to stimulating the recruitment of part-time labour.

"Can't be done" is an immediate challenge to this young engineer-executive's Scottish-Lancastrian blood, and, quick as the flash of a dagger brings forth "I'll show them!" And there is no *mañana* for such convincing demonstration by way of proof. We had ample opportunity for observing that for her there is only one time on the clock—NOW! In recognition of her war services in industry Mrs. Channell was recently awarded the M.B.E.

When Mary Channell roamed the hills, dales and seashores of Lancashire, enjoying the wild freedom of Nature under the tutelage of her

father, she had never studied the philosophy of Mary Parker Follett. But as she fished the streams and shot she unconsciously acquired a knowledge of the unalterable laws of Nature, laws which even wild life must obey or perish.

Subconsciously she developed a keen insight into fundamentals and an analytical mind able to reduce everything to basic factors. She learned the quality of tireless devotion to the task on hand.

Satisfying the urge to create and build, she and her father constructed artistic furniture of antique pattern, so learning the value, and therefore the "law" as regards resultant effect, of human co-operation.

The foundation stone of her dynamic administration was being laid. Ignorant of the teachings of Mary Parker Follett, American political scientist, Mary Channell nevertheless was acquiring the principles which were to be the secret of her success in industry.

At sixteen years of age she commenced training at the Technical School of Engineering. Completing training, a period was spent on experimental engineering. The year 1938 found her with several patents to her credit, and an active business producing ornamental and useful articles in plastics.

Planned Flexible 'Ops'

Before initiating any major action Mary Channell not only satisfies herself that everything is planned down to the last detail, but sees that the plan is correctly drawn up.

She assures herself that she has a complete grasp of the plan so that she can handle any part of it with knowledge during the course of its operation, if need be.

She gives close study to the human element. While she makes up her own mind, she will at the same time listen to suggestions from the humblest employee, for human co-operation is the keynote in the successful accomplishment of any plan. Only then does she strike forward. And no obstacle will stop her.

An engineering plant claiming that a certain temperature is enjoyed by every employee in a building, is of no use if a woman at a machine complains of being cold. Mary Channell will take the girl's place operating the machine and find her own legs getting cold. At some vital point in the production programme that woman might be rendered ill.

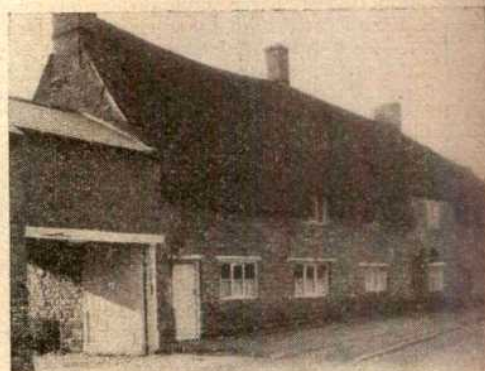
There is one well-known business phrase which is never heard in the Erinex organisation — "All I'm interested in is results." Mary Channell is intensely interested in the human beings who accomplish these results, and how they accomplish them; and that spirit permeates the organisation down through her executive officers.

She is always ready to listen to any personal problem of an employee upon which her welfare officer needs help. For a worried or unhappy employee neither does himself nor the firm, justice.

Mary Channell is not satisfied by reaching the cause or ascertaining the factor resulting in a piece of trouble. She must get down to the



The day is ended and there are moments for reflection. Mary Channell, at home in her cottage



Another cottage, or so it seems. Different though. For this was the original headquarters of Erinex Ltd.

root of the cause. Final rejects of a certain part were too numerous. It was traced to a woman inspector improperly passing the parts instead of sending them back for rectification. Mary Channell did not even reprimand the girl. Taking her quietly aside and calling her by her first name, she enquired, "What's the trouble?" The girl needed glasses. They were bought for her, and paid for by a weekly deduction from her wages.

There would be fewer accidents and greater and more efficient production in industry, believes Mary Channell, if routine periodical in-

Her Efficiency is Due To

Utilisation of local part time labour.

Low Overheads.

Batch Costing.

Personal negotiations by the managing director of contracts.

Making employees interchangeable by teaching them all operations.

Digging beneath the surface in all problems and disputes.

Taking note of every individual's opinion.

Planning to the last detail before taking action.

spection and remedying of employees' eyesight occurred in every factory.

Incidentally, final rejects at Erinex throughout the war, despite the initially untrained female help were under 3 per cent on highly intricate parts.

Throughout a plant, declares Mrs. Channell, there should exist a receptiveness to any employee's verbal suggestion, whether it be worker, foreman, forewoman or managing director. A soldier, just demobbed and new to Erinex, solved a production problem by remembering a war incident.

No labour bottlenecks ever occur at the Erinex plant. Employees learn all operations and are interchangeable. The same principle can be employed no matter how large a factory, by having labour pooled sectionally for interchangeability. Variety of products and variety of operations act as an antidote to industrial tiredness and promote increased production.

"Unemployable" as a Ministry of Labour category is a misnomer, particularly in the countryside. Mrs. Channell has proved that every "unemployable" whom she has encountered is employable at full rates of pay. The country folk all come from good stock. They are wiser than town folk, are more adaptable, and can be educated to reason.

The trouble with most industrial organisations, suggests Mary Channell, is that most executives and directors have no personal knowledge of what they are endeavouring to direct. There is no reciprocal human co-ordination to a common goal. The sales manager is interested in sales, the works manager in output, the chief accountant in his trial balance, the cost accountant in his costs, the general manager in results, directors in the results as shown by the financial statements, the worker in his pay packet, and, completely uninterested in the whole business, the shareholder in his dividend.

On the Sunday preceding our visit to Flore, all Erinex executives, including the sales manager, and the managing director, spent the morning in the factory, with sleeves rolled up, learning the job of making electric kettles!

We would sum up the essence of Mrs. Channell's success in industry as being, that she knows her job, has the ability to resolve a thing into its integral factors and harness them into a dynamic integration with the knowledge that human co-operation is the most important factor of all; and that she realises that industry is not only a physical, but also a psychological undertaking.

Is There a Future For It?

Pending completion of the new factory and housing estate which, in layout, will blend into the scene and atmosphere of the rural village, electric kettles are being made in the scattered, but efficient, village factory units.

Already the kettles have invaded the export field in places as far distant as Texas, New York, and Sweden. Sales plans reach across the world. Electric irons, toasters, fires, and cookers are on the list for production by Erinex. Draughtsmen and tool-makers work side by side in the old village shoemaker's shop. The first on the list will be in production in a few weeks' time.

Horsewoman, tennis, golf, and squash player, crack tabletennis player, and, yet withal, a leisurely champion at the village inn dartboard, Mary Channell we size up as being a "Woman who Matters" in British industry.

One advantage Mrs. Mary Maxwell-Channell, M.B.E., M.W.E.S., possesses over the male executive. In this post-war world in which the tide of advancing womanhood has been merely arrested by the termination of the war, she knows what is going on in women's minds and is not ignorant of the thoughts in the young feminine heads which are in the process of discarding service caps.

Those who like to do such things can speculate about the fact that Mrs. Channell is at this moment engaged in a survey of the feminine potential for engineering careers in the North Midlands. Is her influence in this area to grow yet more widespread and profound?

Three Rules for Executives

Learn how to do a thing yourself before ordering anybody else to do it.

Before exercising discipline over others, be able to discipline yourself.

Know your job thoroughly, and show others by your example.



Target Achieved — The 2,000th 'bus emerges from assembly shop

RECONVERSION—5

GUY'S KNEW— Material Supply then Planned Production to Meet It

By JOHN GILBERT

WHEN I entrained for Wolverhampton at Paddington I ran into an acquaintance—a Birmingham business man. In the course of conversation I revealed that I was on my way to learn about Guy Motors' reconversion. Did I detect envy or jealousy in his voice when he alleged that "That is a lucky lot. I suppose they've made good headway in their switchover, but who wouldn't with all the help they got?"

I told Mr. Ewart Guy about this meeting when I met him—no names mentioned of course—and, said he, "In a way I agree that we have been lucky here. But not so lucky as many people would make out. We reconverted pretty smoothly up to a point, but it would be truer to describe the present situation as one of further transition. Perhaps we have progressed along the road of reconversion further than others and perhaps too, by our example, we have some lessons to pass on to other managements."

The key to Guy's reconversion is discovered in a recent statement of Mr. Sydney Guy, the Chairman of the organisation, when he told the Thirtieth Annual General Meeting that whilst the firm were developing and producing military vehicles in 1936, 37, 38 and 39, it had to sacrifice a good deal of civilian business. Perhaps the Government of yesterday and to-

day are not so soulless as they are often made out to be, for he believes that, as a recognition of its prewar services, the firm was given an opportunity of carrying on either with the manufacture of military vehicles in 1946 or alternatively, gradually slowing down and completing the contracts.

"Guy's chose the latter course and the choice has benefitted the company. By the end of hostilities, in the very week of their cessation, Guy's had produced its last military vehicle and were able very quickly to get into production of their various well known civilian types of heavy vehicles.

"In the case of many heavy vehicle manufacturers, they were forced, by circumstances and by the Government, to turn over their production to an entirely different type of product such as tanks and track type vehicles. They were called upon to do this, not when war was looming, but after the first shots had been fired. New designs, new jigs, new tools and dies had to be acquired under a totally strange management and labour organisation. The whole picture was changed. Decisions were made under the stress of war and expediency was the master in every occasion.

"Guy's on the other hand, by 1939, had already built up a sound technical lay-out. Their de-

signs had been accepted by the War Office just after Munich. The result of this prewar experiment and research permitted us to develop four types of Service vehicles and we were quickly turned over to 100% war production—the only firm in the country to do it at so early a date.”

I would agree with Mr. Guy in claiming that there was little that was fortuitous when, by War Office co-operation, they were allowed by the end of the war, to start lining up for the switchover. Planning had ensured that their products were, by the beginning of 1945, surplus to war needs. They were given facilities to make heavy transport vehicles. Transport problems were growing in the country after six years of strain and improvisation. The firm was given the opportunity to make these themselves. They took the opportunity and their people were soon engaged on production for peace.

Not Luck but Planning

All this build up to reconversion lightened the task as a whole and smoothed the difficulties inherent in the problem. Given this background, it is possible to discount that allegation of luck, typified in the remark of my travelling companion.

“It is true to say,” said Mr. Guy, “that one of the reasons we reached a high peacetime production level since the end of the war in so short a time, has been that much of our work is in the hands of sub-contractors or was in the hands of sub-contractors during the period of hostilities, and we were in a position by means of a policy which I will outline in a moment, to close down on any part of our sub-contractor programme as and when it effected our own peacetime plan.

“We had originally lined up with our sub-contractors in the days when every order was of prime importance to them and to us. They regarded us, not only as customers, but as friends, and that really meant that a lot of our reconversion programme was borne indirectly by these very sub-contractors. There is little luck about that. It was all part of a plan and of a policy.

“Again, in the production of some of our wartime types, design and dimension had been carefully thought out with an eye to the future, so that a lot of our material and most of our tools were usable in the switchover programme.

“Considered also was the possibility of getting away from ‘Utility materials’ which wartime exigencies had forced us to use. For example, iron and steel were used for many purposes when the newer and lighter alloys were more preferable and more in train with modern ideas.

“Foreseeing the possibility of post-war difficulties if dimensions and designs were to be standardised, the firm adopted the policy of

advising wartime users of their vehicles that when the newer materials came to hand and the user required replacements, those replacements would be supplied, not in ‘Utility steel’ but in the newest materials. This entailed, of course, from the technical stand-point, some modification of our patterns, jigs and tools, so that we were ready for our D-Day.

“Long before hostilities ended, we built up a strong and experienced liaison team. These men, in peacetime our outside representatives, were during the closing stages of the war, completing each and every one, a survey of his contacts. Here was an ex-sales force turned into a reconversion progress team and their work had its immediate effect.

“The next problem of reconversion which called for the re-organisation of the whole administrative unit, enabled it to fit into an entirely new set of conditions. A good deal of time and money was lavished on the survey—we call it that for want of a better word—of the manufacturers of units, accessories and assemblies, opposite to our peacetime programme.

“From it we elicited the production programmes and designs and specifications of these suppliers well in advance and we were able to plan our designing because we were kept informed of what our suppliers had in mind. Wartime improvements which could be embodied into their peacetime products, new materials which would necessitate new techniques in handling and fabrication; these and other facts were known to us. Consequently we knew the line to take in planning our production and in framing a policy for our relations between management, staff and workers.

The Value of Works Relations

“Future benefits accrued from our system of using a committee of management in production planning.” Here Mr. Guy reminded me that his firm had the advantage of a long start in the technique of Committee Management. He paid tribute to the enthusiasm and co-operation of all operatives and perhaps it is because this firm has learned the art of using the Joint Factory Council that in the whole of its 30 years, the records show only one strike. As he said, “The principles of the Production Committee idea were old to us when others thought them novel.”

Great stress is laid at Guy's on the value of worker relations. It didn't take the war to teach this organisation that workers were more than just hands, they were really men and women. Every possible attention is paid to the amenities, to the conditions of employment and to incentives for better work and better output.

As far as the switchover is concerned and perhaps a good deal further, the firm feels fairly sanguine about their labour position. A good deal of attention was paid to training tech-

niques during the war and the best of those experiences will be applied now that peacetime production is a pressing necessity.

In those years, they progressed despite a shrinking labour force, by a sound system of training and up-grading, and this, it is proposed, will continue as a basis for staffing of factory vacancies, where possible.

The most injurious bottleneck in the opinion of the management, is in the shortage of designing staff and of the type of craftsmen necessary in an organisation which produces a high quality hand-built job.

Rescinding of the Essential Works Order in May might be a help here. There is the possibility that good conditions, together with scope for enterprise and initiative, will attract the best types of designers and craftsmen, but as Mr. Guy remarked "Abolishing the E.W.O. cuts both ways. We might be losing some of our people from domestic causes, geographical position, or difficulties of acclimatisation.

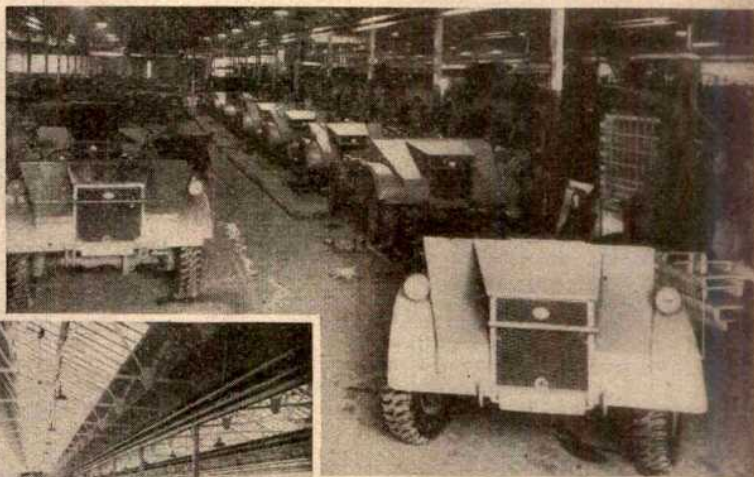
"But," he continued "all our reconversion has been a question of day-to-day planning, always done within a frame-work of experience and foresight. We have run many new techniques and we have learned the value of improvisation. If improvisation permits us to meet any given crisis, then we will use it, but only on the understanding that the quality of our product is, in no way undermined by its adoption.

"How many companies, for example, have adopted the idea of having O.C. Supplies. Here is a post filled by a top-grade experienced administrator and executive, introduced during the wartime shortages crises, and who fulfils a most valuable function in keeping the wheels of production turning when supply bottlenecks are a constant danger.

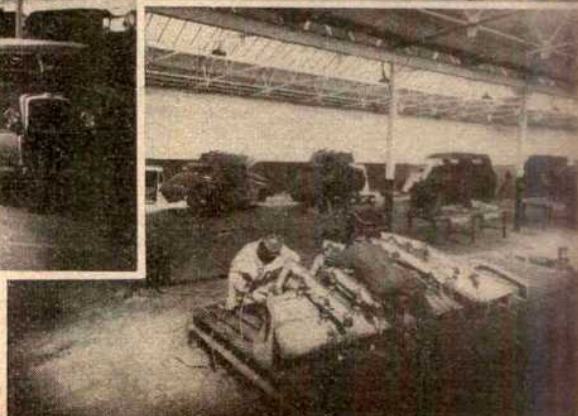
"Amplifying the technique in peacetime, the firm adopting it, by choosing the right type for the job, can ensure fair supply of materials in times of scarcity and what is more, have on their key staff, a materials man to keep the designers and production experts of the organisation fully informed of all questions relating to the development of new materials, sources of supply and all questions pertaining to their uses.

"On the question of output per man, Guy's to-day are carrying out their postwar programme on the same floor space. Superficially at least, this is the case. At the same time considerable areas of many shops are cluttered up with surplus or redundant war material. No decision has been taken as to its fate and in company with many other manufacturers, Guy's

Please turn to page 60



War's ungainly, but highly efficient vehicles have disappeared from the assembly. In their place pleasant peacetime trucks fall into line



MANAGEMENT'S

Stop P.T.O

TOP management is constantly on the look-out for ways and means to improve efficiency. That is their job. Too frequently, however, there are little things which seem to be beneath their notice. Generally, these concern routine and routine is a departmental affair.

New equipment which is to-day becoming more easily obtainable, often improves many routine jobs. A great deal of the publicity about equipment however, is hidden. In particular, many spheres of business literature are aimed, not at the top executive, but at the man in charge of the job. For that reason we are recording on this page in this feature, the details of a piece of new equipment that has just been produced by a British concern.

Its use revolutionises and certainly speeds up file record searching and the entry of particulars or the transfer of detail from one side to the other on all double-sided documents.

The clerk is unable to see both sides of the card or paper at the same time without handling. There is no need to turn to see the other side and in these days of turn and tumble filing and recording, there is hardly need to stress the amount of time and labour that can be saved by using this aid to speed and efficiency. Constant turning over of cards is annoying, causes inaccuracy and slows down the office worker's output.

The equipment itself is inexpensive to operate. It consists of a sloping glass front, the surface of a miniature desk and a mirror above it. There are no expensive accessories, only a small electric light bulb, which can be switched on for illumination when needed.

Costs Anomaly

THE Managing Director of a large food manufacturing company writes to us raising an issue which affects every firm interested in national advertising. Some time ago he made an application to the Ministry of Food—Costing Division—for an increase in price of one or two of their lines.

The Ministry furnished the usual forms and on these was included space for the insertion of advertising costs. Their returns included, naturally enough, a reasonable figure against this item. When several letters had passed between the Costing Department and the firm, in the course of which no objection was raised to the inclusion of advertising costs, a letter finally arrived from the Ministry, the final paragraph of which read:

"In conclusion, I regretfully inform you that

By the
EDITOR

advertising is not admitted as an item of costing by this Ministry at the present time, and an adjustment will need to be made accordingly."

It would appear that no previous official announcement denies the right of manufacturers to include advertising costs in calculating trade and retail prices, and the Editors of BUSINESS

agree with this managing director that there should be little need to stress the anomaly of one manufacturer being denied this cost in his price whilst another has and continues to have the right of including a charge under this heading.

Are we to assume that thousands of manufacturers and business men are to be asked to furnish revised costing excluding advertising and why should the Ministry of Food exclude advertising costs and what reason have they for doing so at this time?

He Cuts Top-hamper



WE learn from Sir Ernest Fisk that Electric and Musical Industries, of which he is

managing director, is getting under way with a new policy for the internal re-organisation of the company. It is an experiment which most live managements will watch with interest for E.M.I.'s directors have converted what have been hitherto mere departments, into subsidiary companies, each operating under an E.M.I. name.

Sir Ernest aims at providing each section of this great undertaking with its own sphere of operation and its own well-defined responsibilities. From a sound and varied business experience, he knows the dangers of cumbersome centralisation and he calculates that the new set-up will permit the executives in each company a greater freedom of action; they will enjoy a greater sense of responsibility and at the same time they will be afforded better opportunities to indulge their particular abilities to the benefit of the Group.

Obviously, there is a lesson here, for in this policy lies a determination to prevent a growing

ROUND TABLE

industrial group from developing too much top hamper and unnecessary "red tape". What is visualised is a family of lively, enterprising units, running their own households to their own ideas with a constant regard to the best interests of the family and subject only to central guidance from Sir Ernest and his co-directors in the parent organisation.

Each of the internal subsidiaries will have its own managing director and the whole will be co-ordinated under Sir Ernest as Governing Director.

Here is a plan which commends itself to the modern idea, for it provides scope to more people and at the same time gives the controlling management useful spot-lights on the strong and weak points in their organisation.

A Give-away

AND here is an experiment of an entirely different nature and decidedly more revolutionary. The Butler Air Transport Company announced that they have made a decided break in the accepted techniques for factory management in Australia.

Under an agreement just drawn up, workers who during the war were engaged on aircraft construction, are to take over and conduct one of the Butler factories in New South Wales.

Breaking the news, Mr. A. C. Butler, Managing Director of the Company said: "An entirely new company will be formed by the workers and the Butler Aircraft Company will finance them and help them until they become established.

"Our machinery will be handed over to them. They will start off with a well-equipped factory which was capable of making precision parts for aircraft in wartime and should make peacetime accessories equally well."

Every man in the company, we understand, is to have an equal share in the business. Such workers as are not in a position to pay for their shares immediately will be financed to make them shareholders. The new workers' executives are to meet the management to discuss Articles of Association.

Whether there is a future in this type of industrial organisation no-one is in a position to say, but we look forward to receiving reports from time to time on its progress or otherwise.

Retailers' Long Weekend

NEARER home, we come to another experi-

Efficient administration, better works relations, improved staff conditions—these are the things in which today's top management are most interested. Together they mean better output.

management technique and possibly entailing quite a lot of internal organisation, but one which might have repercussions on the habits of a considerable section of the community if it succeeds.

F. Hawkins & Co., a large West London firm of provision merchants, have decided to close

their chain of 44 shops at 1 p.m. on Saturdays and to dispense with the mid-week early closing day. The idea is to give the staff the week-end off. As a survey has shown that only 1% of the firm's takings are taken on Saturday afternoon, the decision to close down was made without much misgiving.

If successful, the whole affair may result in shop assistants realising an old ambition—the long week-end. The shops are to remain open until 7 p.m. on Fridays and 5.30 p.m. on other days of the week.

Re-action of the National Amalgamated Union of Shop Assistants, Warehousemen and Clerks is interesting. For long they have urged the mid-day closing on Saturday and though they realise that it cannot be applied to all shops, officials of the Union consider that it is at least practical for provision stores.

The management of F. Hawkins, we would point out, approached this problem after thorough investigation, for obviously they would hardly be in a position to assert that only 1% of the week's takings was the result of Saturday afternoon trading without having investigated the thing fully. In other words, they are sure that very few customers, if indeed any, will be inconvenienced or offended by the introduction of the new policy.

Gauge Men Measure Prospect

IN conclusion, a word of congratulation to the Gauge and Tool Makers' Association for putting on an exhibition which is not only the first of a national character to be organised by any industry in this country since the end of the war, but is also the first the Association has ever held. It is appropriate that the tool makers should be the first in the field in this way, since it is upon their accuracy, precision and correct planning that the success or failure of the main operations of engineering depend. Nevertheless it is to be hoped that there will not be too great a lapse of time before the manufacturers themselves are organising exhibitions of this kind. No time must be lost, no method overlooked, for attracting foreign

GORDON D. JOHNSTONE
*Secy. & Chief Accountant,
W. Gloucester Power Co. Ltd.*

**GUEST
MEMBER**

E. A. LEVER
*Divisional Manager,
The Pressed Steel Co. Ltd.*

JOHN MARTIN
*Secretary, I.C.I.
(Paints) Ltd.*

STUDYING YOUR QUESTIONS



Executives' BRAINS TRUST

Best Way to Reorganise

I We have three typists' pools here, each staffed by a dozen typists. They are to be merged into a single unit to form one pool of 30-36 operators. We are also considering standardising the machines throughout. These girls are busy for 7½ hours each day (5½ day week) typing copies of purchase and sales orders and the usual correspondence work.

The reorganisation must not upset flow of production. What is the best way of achieving a successful result?

MR. MARTIN: If the work of these girls is not similar and can be divided into three pools, they will get better results from three different sections than they will get from one combined section. If the work is entirely similar (and then only) they will get better results from combining the pool.

MR. JOHNSTONE: Apparently they are bringing the typists together from three different sections. The first thing to do would be to standardise as far as it is practicable before merging the three pools. They should standardise every operation as well. Standardisation

of machines may not be the entire answer.

MR. LEVER: It may be that you have one of the pools working on purchase orders, another on sales orders and the third on general correspondence. If that is the case I feel that it is a mistake to merge them, because that will lead to jealousy among the girls.

GUEST MEMBER: There is always a tendency for the efficiency of the pool to drop to the lowest rather than the highest level of efficiency unless there is a segregation to types of work, and delegation of responsibility for those sections.

The only advantage in merging pools is when you have peak loads on certain jobs, and in practice that seldom is an advantage as most girls do not take an interest in work passed from other sections.

MR. LEVER: It is no good attempting to run a comparatively big pool without a very high grade supervisor in charge. She must definitely record the work which each girl has to do and does. She should not type herself.

MR. MARTIN: I feel that if these pools are merged, you are going to have invidious comparisons and jealousies between the girls typing the purchase orders, sales orders and correspondence, and in consequence you will gain nothing.

THE QUESTIONER WANTS TO KNOW...



Q.M. CHISHOLM: We hear that the pool system is giving worse results than ever before.

GUEST MEMBER: The layout of original data and forms should be carefully studied to facilitate typing. This aspect is too frequently ignored. The operators continually dealing with the same job become accustomed to the sources of pick up, but this can very definitely slow up the operators who deal only with peak contingencies. Also of course data must be complete. Here again much is left to the discretion of the typist when typing service is a personal one, and can prove a serious hindrance when dealt with by large pools.

MR. MARTIN: If the merger is necessary for reasons of space, they could put the typing pool in one large office, but keep the three divisions partitioned off, still keeping the three sets of people. It must be remembered that you cannot mix three types of typists successfully.

Q.M. CHISHOLM: The Brains Trust feels that the merging of three pools is always inadvisable if the work is not entirely of one type. Should the merger be compulsory, they suggest that apart from standardising the machines (a) Every operation should be standardised at the same time. (b) The layout of every form and letter should be carefully planned from the viewpoint of typing, as distinct from sales or accounts or production. (c) The room in which the three pools are to work should have two partitions, segregating each group. (d) A supervisor of exceptional calibre would be required who must keep close records, have tactful approach to

Same Problem—Another Department

2 We should be glad of the Brains Trust's advice regarding equipment, etc., for the reorganisation of our postal department (mail outgoing and incoming).

MR. LEVER: For mail incoming they want a letter opening machine. For mail outgoing they want some system of pigeon-holes for sorting mail for insertion in envelopes, if more than one communication is going to a given addressee from different departments. They will probably want a postal franking machine and letter sealing machine.

GUEST MEMBER: On the incoming mail they want someone who can intelligently make a précis of the incoming correspondence. By précis I mean a narrative of the day's correspondence, so that the General Manager may hold a watching brief on the general trend of business relations.

MR. JOHNSTONE: I have only known of one firm of any size that managed to make that work. But when it worked it was amazingly good. One senior woman kept a card index for everybody, on which she made a note daily of all the correspondence, followed the executives up and prepared a report for the general manager.

senior executive to at least have sight of all the correspondence that comes in. In practice that is not half so onerous as it sounds. Probably 95% of the mail is purely routine; but it is the odd letter or two a day which is definitely worth picking up, to see that it is properly attended to.

MR. JOHNSTONE: I think it is imperative that this firm should have a system of recording all letters and what happens to them, because we have all had experience of letters that are not dealt with promptly.

MR. MARTIN: If you want to control the correspondence, a much simpler way to do it is just to call occasionally for a copy of outgoing letters. Give some hours to the job of reading them; the information one glean is invaluable. But don't watch mail *every day*. The delays caused are too dangerous. I am sure that if I had to go through all the letters in my little section they would not reach the departments before 11 o'clock.

If you have chosen your departmental heads and put your trust in them, there is no use in Gestapoing them.

Q.M. CHISHOLM: Having explained the precise equipment required, the Brains Trust is divided as to whether it is better (a) for a director or top executive to watch the opening of the post every morning or (b) for a director to call for a day's mail once every few weeks and work through it systematically.

My own experience is that the first method is ideal for a small concern, but impossible in a large one.

into groups in order to increase interest and efficiency, some incentive being offered to strive for efficiency.

GUEST MEMBER: Individual incentive is to my mind the only one which will ensure a real striving after efficiency, although there are of course certain processes such as smelting and alloying of metals, heavy press work and food processing where it is impossible to define absolutely the operation of individuals. In fact teamwork is essential under such conditions, provided proper time studies are taken and correct contingency allowances determined from absence of operators, etc.; bonus schemes can be operated with a fair degree of success. The real danger lies where bonus based on the output of productive operators is paid to tool room operators, inspectors, labourers and so on. Here it is certain that effort and bonus paid are so remotely related that bonus becomes an accepted part of wages and it would be extremely difficult to measure what effect it has on efficiency.

MR. LEVER: I have had no personal experience of anything which rejoices in the new name of Group Working but, as I understand it, the principle is that work people are put into groups, each of which is responsible for the production of, say, a particular assembly. The groups are kept quite small in size and each is self-sufficient. Every group has a chargehand or leader. A collective basis of payment is often arranged for each group. Group Working seems only to be another name for a procedure which has been used quite a lot in the past in different industries. I believe that Group Working has been used very successfully in certain branches of the light engineering industry during the war. Of course a feature of this industry is that in most cases it has had to employ a big proportion of unskilled labour.

What is a Group Scheme?

3 Can the Brains Trust give us details of Group Working Schemes which have been adopted or tried out here or in America. Under such schemes the work people are organised

MR. E. A. LEVER ANSWERS....



MR. JOHNSTONE: "Cropper's Advance Accounting" (Gee & Co. Ltd.), devotes two chapters to this question.

Getting the Policy over to Staff

4 Past policy laid it down that our women staff retired on marriage. We wish to revise our policy for reasons of progressive efficiency. The new policy, including retention of women after marriage is supported by all women staff, junior and senior.

Opposition is coming from the colleagues of Servicemen due to rejoin us after demobilisation. We know we can use everyone in the years ahead. There are jobs for all. Need we explain our whole programme and all our ambitions to get our policy across?

MR. LEVER: Presumably these people have got a book of rules. In that case, all they've got to do is to issue an amendment that the rule about married women is no longer operative. I don't think you have got to discuss every single thing with your employees.

GUEST MEMBER: There is a fear in very many workers' minds that there won't be jobs for all, so why not state that they have vacancies in excess of their commitments to returning service people.

Q.M. CHISHOLM: Surely this is an opportunity for the firm to do some advertising for themselves, but I agree that their statement should be guarded.

MR. MARTIN: In these unsettled times you can't sell a scheme like this to your employees. This feeling of insecurity is widespread and it principally affects the people who have come back from the war. They think that owing to restrictions of raw material, office equipment and space, that there won't be sufficient jobs to go round.

MR. LEVER: Can you show us any firm to-day that is completely satisfied with the labour it can get? Can you show us firms that couldn't employ many more people than they are employing?

MR. MARTIN: Possibly not. But it's how the people *feel* about the facts, not the facts that we're discussing.

Q.M. CHISHOLM: The company should correct the previous rule in their rule book; they should add a slip to the effect that there is a job for everybody and some of the higher executives should get in touch with junior executives and do a little educational work on the subject.

The Virtue of Economy

5 Many managers are in the same fix as we are. Faced with the fact that many of our workers joined us in 1939 and later, and have simply no experience of normal business economy and thrifty operation, we should like to develop a campaign for our office staff to inculcate an appreciation of the value of business economics.

Can the Brains Trust give us some suggestions or outline a plan to help us?

MR. MARTIN: They can introduce Training Within Industry.

MR. JOHNSTONE: I would suggest that they issue a house magazine at appropriate intervals and take the workers into their confidence as to the finances of the business in which they're employed. How you set about it depends upon the type of worker you are employing.

Q.M. CHISHOLM: As it is an office, they might give their employees some figures about the paper and other supplies they use, their cost and the unnecessary waste to the company.

GUEST MEMBER: Here you want to get down to a factual basis. They know their pre-war

THE QUESTION MASTER SUMS UP



consumption and they should tell their executives what they are going to be allowed.

MR. JOHNSTONE: A house magazine would tackle different angles of the problem.

MR. LEVER: It is a good idea for top executives to have personal talks with departmental heads to inculcate the necessity for economy. That can be taken to a low level. It is a question of finding men and women with a sense of leadership. An office committee often helps.

MR. JOHNSTONE: I don't think office committees help at all because the problems in each department are so dissimilar.

Ensuring Your Overseas Interests

6 We are domestic appliance manufacturers and intend to expand our export business for the first time in our history. We understand that, as a small firm, there would be advantages for us in adopting the group export technique. We feel, however, that this would be outweighed by a tremendous disadvantage.

How do you ensure the impartiality of your overseas agents? How can you protect your design against infringements of its specification if the overseas man reports that this and that modification would improve your product? If three or four manufacturers in a group are making similar articles, are all told of the customers' needs, or is only the one told in whose product the potential buyer was interested but critical?

MR. LEVER: These people are very much out of date in their thought. Export groups were

organised in the early days of the war to encourage export business because we had to get supplies of foreign currencies for war purposes. When Lease-lend came into use the original function of export groups ceased and they came to deal mainly with the rationing of raw material supplies for such export business as was licensed.

To-day export business in general does not need licenses. You can export what you can and where you can over a very wide range of products. To the best of my knowledge many of the export groups have faded out of existence.

The enquirer should, in the first place, particularly if they are small manufacturers, get in touch with the right firms in the City of London who specialise in export of different commodities to different parts of the world. They should put their business into the hands of several of those firms, because most specialise in one or two markets. In this way they will have no credit difficulties with their overseas agents, because that will be the responsibility of the London house handling the business.

If they want to find out particulars of such firms (they also exist in Birmingham, Manchester and Liverpool) they can get all the information they want from the London Chamber of Commerce.

They might also make enquiries from B.E.T.R.O. at 47/48 Dover Street, London, W.1.

Check up on Typist Output

7 On the subject of counters for typewriters, does the Brains Trust consider there is any advantage to be gained by their use. If so, is there any particular type they would recommend?

MR. JOHNSTONE: There is no advantage at all.

GUEST MEMBER: If one could insist on a high standard of work they would be invaluable, but it must be borne in mind that it brings home to the operators a consciousness of not only what they are producing but what other members of the section are achieving. It might be better to be without that consciousness unless supervision is of the highest order.

MR. MARTIN: The job of checking output should be undertaken by the supervisor. She can do it easily by calling for carbons of everyone's output. She can also make allowances for interruptions of any sort during the day.

MR. JOHNSTONE: My experience was largely concerned with counters on billing and duplex machines, where we tried the experiment in 1937 and 1938 and used the results disclosed by the counters to make up charts for operating efficiency for each girl. The theory was that the girls would each strive to be head of the roster. In fact, it worked the other way round, because the "star" operators achieved such a high standard that the other girls who were not as efficient ceased trying at all because they could not achieve competitive results.

Q.M. CHISHOLM: The Brains Trust is unanimous that counters on typewriters, while temporarily useful, invariably reduce output in the long run by making all typists output conscious.

THIS MONTH'S GUEST



GORDON D. JOHNSTONE,
Secretary and Chief Accountant,
West Gloucester Power Co. Ltd.

Back in August, 1944, BUSINESS sketched a revolutionary P.M.H. technique introduced by Jack & Heintz of Cleveland, Ohio. Readers' imaginations were gripped and continually we have been asked for further details. It took time, but here it is in 1946 when P.M.H. is one of the most pressing problems of British industry.



This *IS* P.M.H.

Based on Four Freedoms

By THE EDITOR

CO-OPERATION between management and labour results in more efficient production and until there is profit from efficient production, there is nothing to divide. When there is profit, the consumer benefits because prices are lower; labour benefits because real wages are increased; capital benefits by increased dividends. Henry Ford demonstrated all this in 1914.

Accepting these things, Bill Jack, the president of Messrs. Jack & Heintz, formulated a policy whereby output in his plant increased to such an extent that the revolutionary ideas he adopted to attain it have made him the cynosure of business eyes throughout the 48 States.

To get co-operation, he considers it is necessary that the people of top management be acquainted with the people who produce the goods. Worthless are all other factors such as excellent engineering, chromium-plated offices, streamlined production layouts, all the latest gadgets, welfare and working amenities, until you have the men and the women able and willing to operate the machines that make the goods.

"During the war," said Bill Jack, "the first job of the day was to get on with the winning of it, and the next job was to stay in business when it was over and to have jobs for the men when they came back from the Forces."

Prompt, efficient post-war production, he be-

lieves, can make the difference between the greatest depression ever seen in his country or it can herald the era of its greatest prosperity.

Envious competitors, we hear, make the charge that Jack & Heintz pay enormous wages. This, contends Jack, is not true, but since everyone must make a living and everyone strives to have as good an income as possible, the return for output and effort is important.

Money, would not buy the kind of spirit he has in his factories. Let those who think it, try and buy that kind of spirit.

The fact is that the hourly rates in the Jack & Heintz organisation line up on level terms with every plant in the area and they are less in fact, than those prevailing in Detroit. Many a man joins the organisation at a lower hourly rate than he was getting elsewhere.

The P.M.H. slant here is interesting. For, questioned as to the reasons for acceptance of a lower rate, man after man says he prefers not to work piecework or other systems regarded as incentives to output, because they savour of pushing workers beyond their physical capacity.

At Jack & Heintz, the scheduled working week is 40 hours, but the management lays a limit on an 80 hour week with rates at time-and-a-half. The resultant pay-check is bigger and the employee knows that he buys food and



Production difficulties discussed where they are most keenly understood—on the shop-floor. Here, operator foreman and manager confer

clothing with cash and not with a theoretical rate of pay. In other words, he is quite willing to do more work if he can get more money.

Jack believes that more pay is not inflation if more work is done, and if more goods are the result. He believes too, that where wage rates are low, this is due to inefficiency, for premium rates are economically impossible in the inefficient plant.

Again as an incentive, promotion plays its part. Men and women in the organisation tend to move to the top pay bracket in their respective jobs because individual initiative is encouraged along with self-improvement, and because the hourly rate of remuneration provides no penalty when production is increased.

This, as Jack sees it, is where the danger to P.M.H. arises when piece-rate systems come into operation. Too often in the past, piecework rates have been revised downwards when the worker increased production with the effect that he was being asked to produce more for the same money. Whether he denies it or not, the worker is a capitalist at heart and he resents this; since he cannot get more money, naturally enough he reacts and sets out to do less work.

There's Work A-plenty

These are the restrictive practices which must be swept aside if P.M.H. is to succeed in Britain. They are the antithesis of the cardinal policy in an experiment which has proved that output per man can be achieved, costs can be lowered, selling prices reduced, and wages increased.

The policy is this; the fear of the boss, the fear of illness, the fear of bad conditions, the fear of post-war lay-off, must be banished. Fear of No. four, unemployment neurosis, is very prevalent in Britain to-day. It is a fact that must be faced—a problem calling for urgent solution—for it has a considerable bearing not only on the problems of reconversion, but on the question of the greatest productivity from every worker.

As Mr. Hutchison of the Philips Group, said last month; "The idea that there is but a limited quantity of work to go round, must be shattered."

When Jack got his workers to accept the fact that they were free of these things, he knew that they were capable of devoting all their attention to the job in hand and the job in hand was *production in the factory*.

Moreover, building confidence to replace fear leads to a constructive atmosphere in which management fosters the awakened initiative of the worker. This is altogether a different picture from the technique that is forced to rely upon prodding apathetic and indifferent employees into action.

Policy becomes Actual

Strange indeed that it is not more commonly rallied in the P.M.H. drive, because it is a point of view familiar to most sales managers in successful business, but less familiar on the production side.

So much for the philosophy and the policy behind the Jack & Heintz organisation. But to translate them into action, the mechanics of administration include some novel features as well as others not so new. Among the latter, to take the last first, every department in every plant is lighted with the best that lighting experts can provide. Great attention is paid to cleanliness of the workshops, machine shops and assembly lines. Cleanliness begins in the personnel office and it persists to the outward goods loading platform.

During the war when a worker entered the Armed Forces, if he had been six months or longer with the company, a Trust Fund was set up payable to him on his return or to his heirs, into which is paid 50 dollars monthly. Something to look forward to, and if his wife



The bosses get together too, left Ralph M. Heintz and Wm. S. Jack beside him get down to details

wants employment, there is a job for her somewhere in the plant.

Shop collections for charity and presentations are avoided, but a Welfare Fund, properly organised, replaces the old charity idea; and as the workers themselves are behind the organisation of this fund, all questions of disbursement are settled by a committee of workers. Grants, presentations or payments can be made and there are no disturbing marauding charity raids, department to department, to upset the rhythm of production.

More unusual, are the following services, provided to assist all workers of the organisation in the business of living. It has been discovered that this assistance avoids considerable loss of man hours on the job and conserves the worker's limited personal time and energy after his day's work is done.

A small but excellently trained, experienced staff renders assistance to all employees in filling in official forms. A by-product of this branch is a legal advice service and another development of the same service comes in the shape of assistance in the filling up of Income Tax forms. We of course in this country, are spared this last under our P.A.Y.E. set-up.

We too, Should Like This

Many employers in Britain would certainly like to institute the next service—namely, to aid inadequately housed employees in finding better living quarters. This is a pretty tough job in the States to-day, but it is practically impossible in this country.

Where staff or operators own their own cars, assistance is given in obtaining proper maintenance.

All these services aid production by reducing or avoiding a considerable loss of working time by the individual, for, able to rely upon expert help which minimises the amount of time spent in worrying activities, his leisure time is exactly *leisure* time.

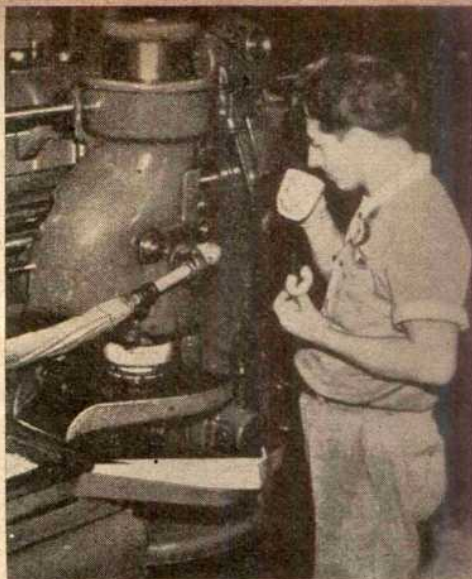
On the production floor, there are many aids to higher output. For instance, racks of job cards are located at convenient spots throughout the plant. This makes it possible to compute cost of all operations and arrive at cost of finished products.

Conferences right at the machine with foreman, plant manager and operator, are quite a feature of production when unusual snags or difficulties crop up.

Every aid to efficiency conducive to motion economy is incorporated in every assembly layout. Conveyors are used wherever possible and where precision assembly is a feature of the operation, extra attention is paid to lighting.

On the welfare side, supplementing the usual activities of the factory doctor and the personnel manager—services closely allied to production—there is a distinct innovation, a Credit Fund for the use of workers who may find themselves in temporary financial difficulties. Organised as a Credit Union in 1942, to-day it has over 3,446 members with funds totalling almost half a million dollars.

First-class canteen facilities are also provided and a monthly house magazine, giving news of



Production fillip comes along, halt for refreshment on the job combats fatigue. Service is at the operator's call any time he wants it

every description, the policy of the organisation and a great deal of human interest, fosters a better understanding between labour and management.

A distinctly novel feature in the management/labour liaison set-up consists of a team of what Bill Jack calls "ambassadors of good-will". These are his personal representatives and they roam through the plant, department after department, day and night. Their job is to listen, and to talk to any worker and to help in any way possible with his personal problems.

A very Special Executive

They can never put forward the pretext "we are too busy to listen." For that is their job. They take an employee's problems as far as they can, and if it is such that it is one for which special machinery in the Welfare department is already provided, it is their duty to bring it to the notice of the responsible executive or committee in that department.

Every month, a mass production meeting is held. During the war, when there were day and night shifts, two such meetings were conducted every month. The President of the company and the production heads talk about shop and production problems and questions from the floor are answered. This way, rumours are stopped with facts and workers develop a feeling of working together towards the same goal.

There are many other picturesque and novel features which have resulted in a high efficiency factor and an excellent P.M.H. record. It is best told in pictures and the Editors of *BUSINESS* are now arranging for original photos to be sent here in order that you can see for yourself the whole technique and method at work.

Business Calling . . .

Quotes the Policy of Leaders Helping to Shape Peace Plans

SIR CLIVE BAILLIEU

Three-fold Task for Government



A THREE-FOLD task for the Government is outlined by the President of the Federation of British Industries, Sir Clive Baillieu. The Government he says, must (1) Reconvert manpower as quickly as possible to peace-time purposes; (2) Secure food and raw materials from overseas to sustain life and industry; (3) Find ways and means to make overseas payments.

Referring to what he describes as "the popular and dangerous illusion" that what was done in war in the financial field can be done in peace, Sir Clive declares that our position today is one of complete unbalance, like that of an inverted pyramid, with industry, commerce and business at the bottom seeking to support a vast mass of expenditure. We must restore the balance by reducing the top hamper under which we labour and broadening the base of our productive activities.

"The country needs to be told by its leaders more often and more fully the facts of its economic and financial situation. Whilst this is serious, it is not desperate; it can be solved provided we have the courage to face fundamental facts and we realise that salvation rests in work, sweat and production."

SIR CECIL WEIR

"Britain Can Make It."



VIEWS on the coming national exhibition entitled "Britain Can Make It" which has been arranged by the Council of Industrial Design, are expressed by Sir Cecil M. Weir. Pointing out that it is not a sales exhibition but a preparation for such, Sir Cecil goes on to say that "Britain Can Make It" is intended to serve as a stimulus to the maker and designer as well as a demon-

stration to the public that our industries are eagerly conscious of the needs of their cus-

tomers and consumers and can satisfy and give a lead to taste.

"We are well aware that many manufacturers are not ready in the autumn of 1946 with all their post-war ideas, that shortage of labour and certain materials still persist, and that a year or two later things will be very different in these respects.

"But time waits for no man and our competitors are, generally speaking, in no better position than we are and some of them are much less ready. This is not the last exhibition of industrial design; it is the first. I hope that it initiates a long series of displays by the Council and by individual industries which will, from time to time, bring before our people and the world the merits of British design, arouse the interest and enthusiasm of designers everywhere, encourage young people interested in art and applied art to become trained for this side of industry and persuade industrial firms of the advantage of offering opportunity and advancement to men and women who desire to adopt this as a career."

SIR FREDERICK HEATON

Unification of Transport



"I AM so far satisfied that in the public interest unification is essential, that if the only way it can be attained is by means of nationalisation, then so be it." This is the view of Sir Frederick Heaton, chairman of Thomas Tilling Ltd., and it refers to inland transport. Nevertheless, Sir Frederick has his own ideas as to the best way of improving the transport system of this country.

"Unification, without nationalisation, would provide a satisfactory solution of the whole problem," he declares. "In a scheme of unification such as is in mind the Transport Authority would require to be entirely self-supporting, whereas in the case of nationalisation there would be a grave danger that, sooner or later, the National Exchequer would be called upon to meet a deficiency.

"By unification is not meant one big authority only to control the whole of the railway, road transport and other interests. What is meant is that there would be, firstly, a National Transport Authority which would take over the main line railway companies, together with all long distance services of public service vehicles and

all long distance goods haulage services; canals would also be included. It might be thought desirable to bring in coastwise shipping and internal air services, but this would be a matter for consideration.

"Secondly, there would be set up a number of purely local Passenger Transport Boards for the purpose of co-ordinating as public utility undertakings the existing local passenger transport services, municipal and private. Each local Board would be autonomous and inter-area traffic facilities would be provided by agreement with its neighbours."

MR. W. C. WARWICK

Shipping Taxation Burden



ATTENTION is drawn by Mr. W. C. Warwick, chairman of Houlder Line Ltd., to a new and, from the shipping industry's point of view, unfortunate aspect of the incidence of taxation liability arising from the Finance Act approved by Parliament last April.

"In the past," says Mr. Warwick, "any surplus arising from the difference between moneys collected from ships lost or sold and their written down values has been, properly I think, regarded as capital profits and not subject to tax. Under the Finance Act of last year any difference between the written down values of ships and the proceeds of those lost or sold, so far as this difference is represented by depreciation, will be subject to tax and represents a very serious additional burden on the shipping industry."

"It is true that taxation liability can be deferred by utilizing the credit for writing down the value of new ships that may be acquired, but allowances for depreciation will then only be allowed on the value so reduced and not the actual cost, so that ultimately the additional liability has to be faced, and this, I am sure, must inevitably have serious reactions upon our industry at a time when we shall have to face very intensive world competition and will, I am afraid, prove a serious obstacle to the maintenance of an efficient British Mercantile Marine."

MR. RALEGH B. PHILLPOTTS

A Knighthood

ALL who are in any way interested in office mechanisation will have been gratified at the inclusion in the recent Honours List of the name of Mr. Raleigh B. Phillpotts, chairman of the British Tabulating Machine Company Ltd., upon whom His Majesty has conferred the honour of Knighthood.

Trained in the law, Mr. Phillpotts became the secretary of the British Westinghouse Company and it was during his tenure of office in this capacity that the claims of Dr. Hollerith to have invented an entirely new method of re-

cording and collating statistical data, came to his notice.

Satisfied that there was something in it Mr. Phillpotts, with the backing of a little coterie of friends, formed a syndicate in 1904 to bring to this country the first punched-card machines. Much scepticism, sarcasm, indifference and inertia had to be overcome, but the company was successful in doing this and to-day it employs nearly three thousand people.

SIR WILLIAM LARKE

A Retirement

SIR William Larke is retiring from the position of director of the British Iron and Steel Federation at the end of this month. He was appointed the director of the National Federation of Iron and Steel Manufacturers in 1922, and has been associated with the progressive organisation of the industry since that date, culminating in the present British Iron and Steel Federation and the British Iron and Steel Research Association.

MR. J. L. BROCKHOUSE

Government must be Enterprising



THE hampering effect of restrictions is referred to by Mr. J. L. Brockhouse, managing director of J. Brockhouse & Co. Ltd., who says: "The building programme is still in its initial stages and as yet only a dribble of domestic articles are coming forward. The motor industry still feels itself shackled down by taxation, restriction and controls, and shortage of labour which

makes large-volume output impossible. Other commodities are subject to restrictive controls which prevent us manufacturing, although we might have the labour and material on hand to do so."

"There is no doubt that at the present time many of the restrictions and controls have a very hampering effect upon industry, in so much as if they do not theoretically prevent industry resuming its normal occupation, they are slowing down the whole operation. Most manufacturers, I feel, agree that certain of the restrictions and controls must be maintained in order that recovery can be achieved in an orderly fashion, but the art of applying those controls is to apply them in such a manner that they do not hamper the recovery which is the aim and object of their existence."

"We are urged by the Government to be enterprising in business and be prepared to take risks. I think we can fairly urge the Government to be enterprising in their administration and be prepared to take the step of relaxing some of the controls in order that the recovery of industry may be achieved in the shortest possible time. I am sure that the general public do not realise the extent to which manufacture is controlled to-day."

GUY'S RECONVERSION

- Continued from page 47

find their efforts impeded through the use of valuable space not only being occupied to no purpose, but occupied for an unspecified length of time and hindering the prosecution of plans for new lay-outs.

"Despite this, however, the war years show the firm's labour force stepped up by 100%, approximately the position to-day. But output has increased by 400%." Asked for an explanation of so satisfactory a position, Mr. Guy stated:

"It is due to three specific reasons. (1) The firm is run by a resident Board of Directors who know the job from the office to the factory floor and from practical experience, and by co-operation they set the pace. (2) The firm is fortunate in that its employees are an extremely levelheaded cross-section of labour and good labour relations techniques help to maintain labour stability. (3) Every possible incentive to output receives consideration by management and men."

Some Notable 'Firsts'

To attempt to summarise some 30 odd years of industrial progress made by this firm is a pretty tough order but it is no more than justice to scan some of the pioneering achievements of the firm which are now recorded in the pages of transport history. It is also necessary, in the light of these achievements, to review in brief the factory techniques which have contributed to technical efficiency, and the management methods which have built up a first class working morale throughout the works.

To begin with, most of the following designs and types originated by Guy Motors have subsequently been adopted in various firms elsewhere.

"Overdrive" and Governed Vehicle Speed; "Light" (2-ton) Commercial Vehicle; 350-h.p. Nine Cyl. Radial Aero Engine produced in 24 days; 2½-3 ton battery Electric Vehicle; V-8 Engined Car; Automatic Chassis Lubrication; "Spud" wheels for cross country work; Promenade low loading runabout; Roadless (caterpillar-track) type; Travelling showrooms; Low loading (drop frame) chassis; One-man operated bus with patented emergency exit; First military six wheel, four wheel driven cross country vehicle; Six wheel, four wheel driven double deck petrol bus; Six wheel, four wheel driven double deck trolley bus; Patented system of trolley bus regenerative control; Gas producer vehicle; Six wheel, four wheel driven armoured car; Six wheel driven chassis; Eight wheel driven chassis; Four wheel driven "Quad

Gun" tractor and light tank wheel; Four wheel driven "Lizard", and the patented welding of armoured hulls.

Next, reputation has depended on quality and it can be taken with all certainty that careless switchover and untried methods will not be allowed to jeopardise so fine a record. The tested ideas and schemes we have now outlined, are to be maintained. Another important factor, servicing, despite the tremendous difficulties confronting the organisation to-day, will be further improved and it should be noticed that the use of wartime materials have added to and aggravated the trouble of everyone's service department.

The arduous nature of the tasks undertaken by service vehicles certainly makes unusual calls upon their producers if they wish to give their users a first-class and reliable service.

Guy production methods, as well as the testing to which every vehicle is subjected are most comprehensive. Raw materials undergo thorough laboratory tests before being passed for production in a very up-to-date machine shop; inspectors scrutinise every part during manufacture, measuring to fine limits.

Engines are tested under their own power. Following hours of running-in, the full load is applied and, after an extensive further test, each unit is stripped for examination and, if satisfactory, is re-assembled and passed to the chassis erection line.

Extensive erecting shops are laid out efficiently to handle the construction of every type of commercial and passenger vehicle. On completion, every vehicle is fully laden and taken out three times for separate road tests by different drivers. When ready for delivery, a final test is made by an independent inspector who judges the vehicle from the point of view of the ultimate user.

Reliability & Figures

The value of manufacturing care is revealed by a recent analysis of some of the older users of Guy vehicles. It showed that of Guy vehicles owned by these operators, over 26 per cent have been in continuous use for 10 years or more. Some of them are as much as 19 years old, and many have been running an average of 50,000 miles a year.

About 70 per cent of the vehicles delivered by Guy Motors Ltd., represent repeat orders.

A good slogan receives world wide circulation. "Feathers in our Cap", was amongst the most widely known of its day.

To-day the symbol of long service is still the Guy Indian head, fitted as a mascot to all Guy vehicles and "borrowed" by drivers of many other types of vehicles for its quality of attraction. To these feathers of industrial achievements of prewar and wartime years, I think that now their reconversion can be safely added.

The Mechanics of Job Rating

Whose Pigeon Is It Office Manager Or . . . ?

By PETER DRYDEN

DAILY the outcry for a national wages policy grows more insistent. At January 1st, 1946, the cost of living index figure was 103 points above the level of July, 1914, and 47 points above the figure for July 1st, 1939. The cost of living is generally taken into account in the reckoning of wages, but in practice (if not in theory) the value of those wages has also been affected by the purchase and other taxes.

For this and other reasons, sectional demands for increase in wages continue to be made. As one trade union pits its strength successfully against the employers, the union most closely related to it inevitably tries to win a similar increase in order to satisfy its members. It is a vicious process, one that can only lead to increased production costs, inflation, and—perhaps worst of all—loss of our already stunted export trade.

What Should Be The Basis?

There are two sharply divided lines of thought on the application of a national policy. There are those who feel that it should be tied to the national economy much along the lines of the cost of living index, and fluctuate according to its dictates; and there are others who feel that the wages policy should be based on payment by results.

Both sections miss the point. In the first case it is a normal human reaction to resist a cut in wages, however justified, and this will tend to offset the notion that the cost of living index should be the governing factor.

In the second case we have in this country a huge non-productive working population. In the main they consist of the civil and municipal services and the utility services. These cannot be tied to output unless there is a reconciling factor that limits the number employed per unit produced, or letter posted, or passenger carried, and so on.

Again, if P.M.H. is to be successfully attained in this country, it needs something more than mere lip service. It demands a vigorous, clear cut policy on the question of rewards for service so that the employer will not only know where he stands as regards his costs, but will also know that for every pound paid out in the form of wages, he will be getting back a commensurate output in work units.

Further he will also be protected against being "blackmailed" by high wages competition within the same industry. The larger industrial unit can afford to pay higher wages because of

the greater turnover and, further, the carrying of "passengers" is of consequence only in proportion to the total pay-roll. The smaller works cannot afford such luxuries, and it should be remembered that 95 per cent of the employing agents of this country are classified as "small."

PRODUCTION RATING (Hourly Paid)

PART OR UNIT

NAME OF MACHINE

AND EQUIPMENT

1. SKILL, TRAINING AND EXPERIENCE.

(a) Learning Period.

100 = Average of
3 months.

(State length of time required before a normal operator can perform the job satisfactorily without overlooking, and produce enough to earn 25% bonus, or normal hourly rate.)

(b) Previous Experience.

100 = Average of
3 months.

(Before the job can be done at 25% or normal hourly rate bonus, is it necessary for an operator to have previous experience on this job or on some other job?)

(c) Mechanical Ability.

100 = Self Setting
100 = Intricate
Assembly

(What degree of technical skill is required?)

(d) Complexity of Processes.

100 = Complete
Responsibility

(Does the operator require the mastery of an unusual number of details? e.g., reading blue-print? mating close tolerance machining?)

(e) Personal Application of Adapt- ness or Dexterity.

100 = Outstanding
Ability

(Does the job require unusual speed or concentration to be performed successfully, and is an exceptional degree of brain and muscle co-ordination necessary?)

ANALYSIS BASED ON JOB RATING

CLASS	M'n. Rate (100)	Skill	Training (Apprenticeship) (Graduate) (Diploma)	Experience	Special Skill	Merit Award	Initiative	Trust (Personal)	Responsibility	Total Points	Per Week of 45 hours
Draughtsman	1/6	45	25	10	4	—	—	—	—	184	£6 4 4
Chargehand ...	1/6	10	5	15	—	—	15	—	5	150	£5 1 3
Shop Supt. ...	1/6	50	20	30	20	15	20	15	30	300	£10 2 6
Tool Maker ...	1/6	50	25	20	10	—	—	—	5	210	£7 1 9
S./Typist ...	1/6	15	15	5	—	—	5	—	—	140	£4 14 6
Conf. Secretary	1/6	15	15	5	5	—	—	10	—	155	£5 5 7

Clearly, therefore, a national wages policy would confer immeasurable benefits on industry. Such a policy is just as important for the clerical and other commercial functions as it is for industrial producers. Any wages policy must be universal in its application, and specific in its determination of reward. The difficulty is to establish a formula that will meet with the approbation of workers, employers, and Government.

But there is a system that will reconcile the wages of all industries with each other, and it is known as job rating. It has been successfully applied in private trading and manufacturing groups to stabilise the wages within their respective orbits.

Job Rating in its Simplest Terms

Job rating is simply the technique of reducing the various craft skills, experience, training, personal initiative, etc., to a common denominator. It aims at standardising the merits so that wage increases are based on ability and the contribution that the worker makes towards the general welfare and prosperity.

Such a scheme requires to be handled on a national scale, either by an appropriate Government Department or by a joint wages council. Despite the avowed mistrust of Governmental or Ministerial interference in the economics of industry, it is clear that not a single or collective effort on the part of industry itself will be able either to finance such a scheme or instal the facilities for seeing it through.

The successful application of job rating within any domestic sphere, depends for its efficiency on the theory that all the employees are paid a minimum basic rate. It is important to establish this fact and to envisage that *all* the employees, staff, supervisory, creative, productive, ancillary and even executive are based on the same fundamentals.

Once this point is established it remains then

only to assess what rewards should be given for any particular degree of service rendered by the employee. The variation of this degree is reflected in the variation of the wage or salary. Some will be paid not for what they do, but for the knowledge they possess. For example, a chemist would be paid, not for his actual contribution to the general output of the factory or plant, but for his knowledge which will permit the firm to be able to solve its problems as and when they occur.

This develops the point that job rating will take into account not only productive ability (which includes skill and experience) but also academic qualifications, which enable the holder to contribute, although indirectly, to the welfare of the organisation as a whole.

Take a simple analogy: one typist will be assessed on her shorthand ability, say 140 words per minute; also on her typing skill, say 50 words per minute. Another with the same high degree of skill will also be retained as a confidential typist and will be accorded a higher degree of rating because she will be paid additionally for the secretiveness of her job.

Since basically all the working performances start the same, this in industrial organisation would represent the lowest break-even point in the budgetary control system,* and generally would be the lowest figure paid in the form of wages, i.e. that wage paid for unskilled labour contributing an adequate quota of expendable energy. From this basis would be built up the awards for the varying extra contributions towards general prosperity.

Nationally this break-even point would not be termed such—it might be the cost of living index since this must needs be the minimum standard for every person in the country. The fact that this figure is considerably lower than the present unskilled rate is of no significance in this consideration. In point of fact they both

* Mr. R. W. Fry covered this factor in his articles on budgetary control in the November and December, 1945, issues of *BUSINESS*.

represent a basic which is the first requirement for any system of job rating.

In fig. 2 will be seen an analysis based on job rating. The assessment of the director may have to be considered, but in comparison with the other members of the organisation, it will be seen that even on this imaginary scale it is evident that an adequate comparison may be made.

Normally, the breakdown of the craft skills is done by a panel upon which would normally sit a representative of the workers, a member of

the management and, desirably, an umpire with powers to arbitrate.

The actual determination can be done by a simple analysis shown in fig. 1. This, it will be seen, endeavours to find out the value of the job rather than to assess the value of the worker who is to fill it. By evaluating the results in percentages, some sort of affinity will be established in relation to the works as a whole.

Nationally it would be a gigantic task. But what alternative is there?

Abolish This Tax — It Hampers Efficiency

EVERY machine, every bit of office equipment, every card index, every business document and envelope bears a heavy tax. These are the tools of administration. We are urged to strive for maximum efficiency. At the same time, the brakes are put on efficiency by the continuance of a heavy tax on the tools of efficiency. This is bad business and bad psychology.

This was the burden of a pointed and reasoned address by I. J. Pitman, M.P., when he addressed the luncheon meeting of the Office Appliances Trades Association of Great Britain and Ireland in London recently.

"Office machinery and equipment with their related factory and business forms are the tools of management," said Mr. Pitman. "So essential are they to normal peacetime industry, commerce and finance, that they became even more essential in wartime with the shortage of office staff and the inevitable deterioration of the clerical capacity remaining. The marvel is that so much was accomplished by so few; but we learned in the war the great value of tooling-up our factory offices to match the prodigious tool-up in the shops."

The speaker went on to stress that one of the chief objects of the Government must now be to encourage and assist every undertaking capable of accelerating the return to normal conditions. Obviously, the vital part that office equipment can play in successful reconversion can be helped if conditions are eased to face retooling and the replacement of out-worn equipment. The practical flow of goods from the factories would come all the more smoothly were the Government to remove unnecessary obstacles from the stream of industry.

The re-equipment and re-tooling of offices must proceed side-by-side with factory reconversion. Likewise, the commercial offices, banks and insurance offices, all with their part to play, must not be deprived of the necessary equipment.

"Indeed, the costs of the manifold services rendered to the world by our banking, insurance and merchant houses," said Mr. Pitman,

"are determined by clerical and office tasks.

"For some illogical reason, the late Government were exempting the production tools of the factory from Purchase Tax, while continuing its imposition at a heavy rate of 33½% on the tools of the office."

It seems that it is forgotten where it should be most widely appreciated, that office appliances are the very stuff of the production plan. They produce the paper work upon which depends efficient manufacture and economic distribution of products. The complexity of modern civilisation demands the systematic recording and collation of facts.

A host of special appliances are needed to perform these tasks economically—adding and accounting machines, calculators, duplicators, typewriters, time clocks, record systems, filing equipment, dictaphones, postal franking machines, addressing machines, statistical tabulating machines, office desks and seating. And their essential supplies—carbon papers and typing ribbons, stencils, factory forms, invoice sets, ledger cards, stock and progress records, envelopes and business stationery.

When industry was geared to feed the insatiable demands of the war machine, the Government, as the chief buyer, ultimately paid its own Purchase Tax on office appliances. To-day the situation is different.

The tax on office appliances and business stationery now directly inflates cost of all production, transport, insurance and all commercial activity.

The cost of British exports at every turn are increased thereby. It is indeed anomalous that although export goods themselves are exempt from taxation, there remains a substantial tax content in their cost due to the imposition of tax on half of the plant needed for their production.

This is a tax on efficiency. It is a basic attack on efficiency, conducive to cost cutting techniques in just the wrong place. Economies, if they are attempted, in the planning of production and distribution, undermine the whole structure of the industrial and business fabric.

Five SHORT CUTS to Office Efficiency

For Efficient Buyers

IT is a sellers' market they say. And that is tantamount to saying that our buyers are busy. To-day then, it is up to the methodical buyer to ensure that his office service is accurate and reliable.

A time-saver for the purchasing officer, we learn, has just been worked out by one North country organisation. The plan includes the insertion of a duplicator master copy in the purchase order sets, so that this master can be put on a duplicator for any amount of copies whenever possible.

While the purchase order set has seven parts, the number is generally sufficient for all usual purposes. There are times when many more copies are needed. When this occurs, the master sheet is an important time-saver.

Record—Order Combined

ANOTHER company tell us that they use part 4 of the purchase order set as a permanent card for the purchase record file.

By having this fourth part of the purchase order set printed on a heavier weight paper and perforated properly, the top and bottom card of the copy can be torn off so that a file card, 8 by 5 inches, results. This card is automatically filled up as the purchase order is written. Both this set and the one mentioned in the short cut above, are proving their value in saving valuable buying time every day of the week.

Eight Point Delivery Policy

DISPATCH departments have their troubles too. Tyres, petrol and manpower still retard ideal delivery service. Here is an eight point policy which is helping the firm using it over present problems.

(i.) Not more than two deliveries to be made from any one point of origin to any one point of destination during one calendar week.

(ii.) Goods not to be delivered unless the package or lot to any single purchaser weighs more than 5 lbs. or exceeds 60 inches in combined length and girth.

(iii.) Delivery to be made of parts or supplies of goods needed for repairs or sale which are:

- Stored, altered or processed after and as part of a sale.
- Ordered by mail or telephone (subject to No. vi. below).
- Delivered to a person other than the buyer if the person receiving the goods is to retain possession.

d. Delivered to replace goods delivered in error or damaged in transit.

(iv.) No order under 10s. exclusive of purchase tax shall be sent C.O.D.

(v.) Not more than two attempts to be made to deliver any article or lot of goods.

(vi.) Letter or telephone orders not to be accepted for delivery unless the single or combined order totals 10s. or more.

(vii.) There will be no special delivery except by the use of the parcel post.

(viii.) Goods not to be collected for return unless they have been delivered in error, damaged in transit, weigh more than 5 lbs., or exceed 60 inches in combined length and girth.

Films for Office Procedure

FILMS can play a great part in teaching office staff procedure and know-how. We are frequently being asked if we know where such educational films can be obtained. We have to admit, so far, that we have failed to trace any in this country.

American office managers evince the same interest as our colleagues on this side on the subject. There is a dearth in the States too, of this kind of film. An American business organisation informs us that they are preparing a course in work simplification for their office supervisors. They would like to obtain films to show to the entire office staff.

Only one company, as far as our information goes, has turned out a successful educational office film or an office simplification, and that is an American equipment concern.

What about it, British office equipment manufacturers?

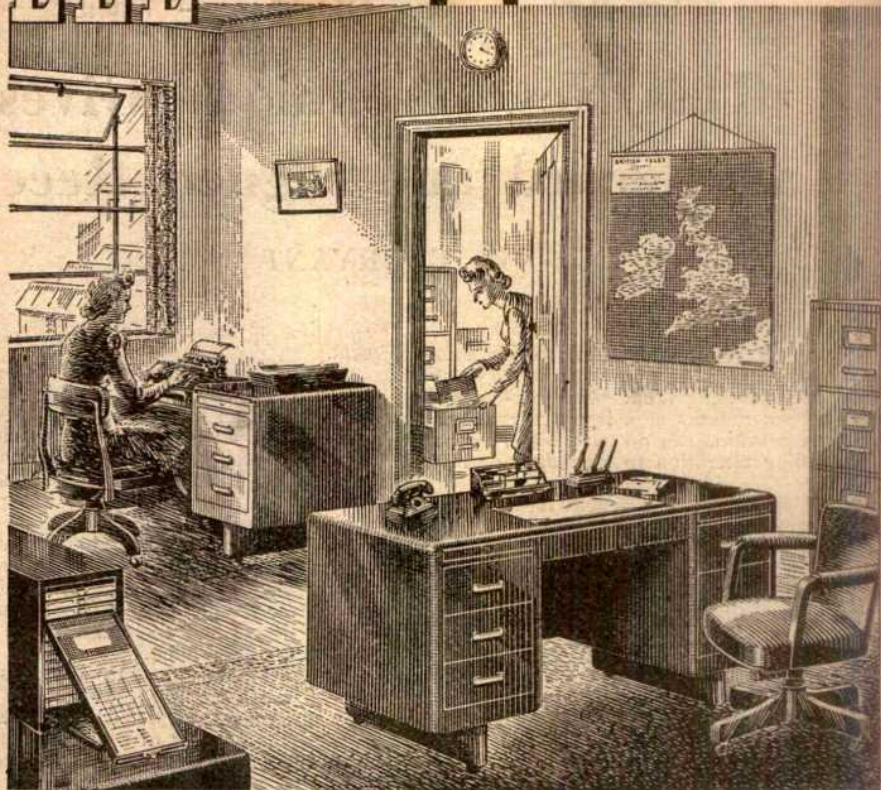
Daily Purchase Report

A GOOD tip comes from an American organisation, the Bendix Aviation Corporation, who are now using a daily purchase commitments' report to ensure a control against over-buying of any item and assuring that commitments are being made with sufficient speed and volume to permit production of all parts required for the month.

The report is prepared on punch-card machines and enables the company to make an important saving in staff power.

Eight other control reports, such as monthly parts requirements, etc., are produced on the machines with only ten people. It is estimated that at least thirty people would be required if the same reports were prepared by manual methods.

STEEL office equipment



The Secretary's Office

Yes, this office is furnished throughout in STEEL. Moreover it has all the distinctive appearance of an ART METAL office, reflecting dignity, efficiency, cleanliness. Also it is a bright, cheerful place, an incentive to better work.

Apart from its effect on the owner, an Art Metal equipped office impresses visitors with its air of planned efficiency. The first sight of such an office unconsciously creates a feeling of confidence.

Like all good things Art Metal is in great demand these days, so we cannot promise you delivery from stock like we used to do. But it IS being made, and is well worth waiting for.

Why not send for Catalogue No. 60 today?



Art Metal



CONSTRUCTION COMPANY

OFFICES AND FACTORY: 201 Buckingham Palace Road, S.W.1.
Telephone: Sloane 5201 (6 lines).

Tax Card, Wage Sheet, Workers Receipt
Complete in One Operation — When

This New Technique Gives Tax Record and Signed Receipt

By C. BRYANT

IT is good to learn that new machines introducing new methods are coming into the hands of executives who are out to improve office techniques. What was "to-day's best method" six months ago, is already dated, but the same machine can do even better by means of a trifling alteration to stationery or method of use.

In industry there is a general belief that you just cannot escape writing up the tax card, wage book and envelope separately. Much time in clerical work is lost thereby. This method with the new machine, was designed to reduce form filling, official and otherwise, to a minimum. It was designed to reduce the peak load on certain days of the week and it is simple enough for a junior clerical operator to work after the first instruction. There are no secret new materials in its use, nor in its method of application are wartime office expediences resorted to.

It utilizes however, the lessons learned during the first two years of P.A.Y.E. It is unexciting but efficient. The system simplifies a number of entries, reducing the time hitherto needed and

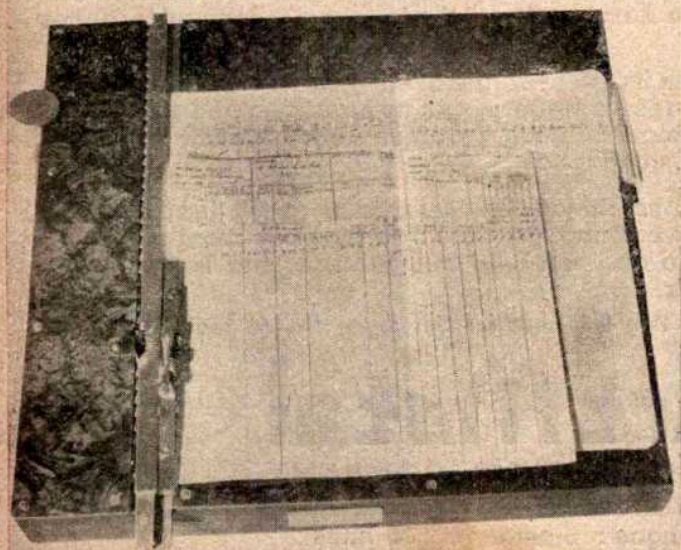
speeding up wage office work by 55 to 65 per cent.

I have committed myself to discuss P.A.Y.E. because the new fiscal year is bringing back again many an executive headache. A method must be discovered which is efficient when it comes to wages make-up. The usual human inertia, which has prompted so many to work by methods that were costly, was good enough while the war lasted.

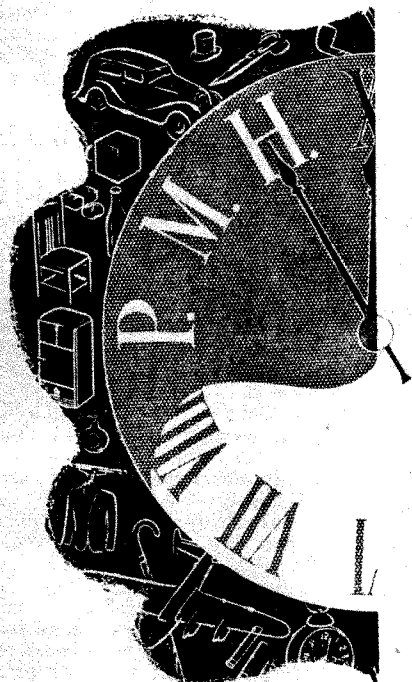
Now we have to pull ourselves together. There have been many complaints from our high executives of the falling off in office output, but as far as the wage office is concerned, it is easier to get rid of this attitude than many people seem to think.

Procedure at present usually consists in writing up the wage book. When this is done the tax cards are completed in a second run of entries, the number of which depends upon the number of employees on the pay-roll; and the third operation, the transfer of the figures to the wages envelopes, either directly or by means of a perforated slip.

All these are quite orthodox and up to a



The machine holds payroll and personal card by snap mechanism. Pay envelopes or workers' receipts forms in magazine under writing surface are ejected on depression of lever seen on left



Production goes 'Clockwise'

Greenwich time, runs 60 minutes to the hour—no more, no less. But * P.M.H. is variable and is increased by the installation of T.R. Time-Control Service. This system establishes a standard Factory time—to the eye, the ear and on the records. In addition it exposes non-productive time and provides the basis for dependable Costings. In T.R. equipped factories production truly goes clockwise and like clockwork.

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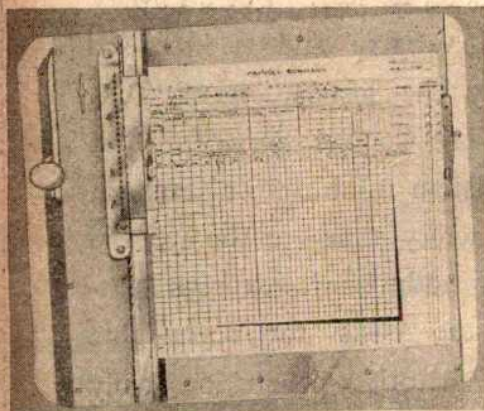
Installation Companies in London, Birmingham, Bristol, Cardiff, Leeds, Manchester, Newcastle-on-Tyne, Sheffield, Glasgow, Belfast, Dublin; and Maintenance Engineers throughout the Country.

point much the same method has been used with this new machine. Here, however, is a new method which disposes of the conventional almost entirely. There is no shooting at the moon but writing and re-writing three times for each worker is cut right out. There are no perforations to handle and no finicky envelope insertion work. This is how it is done.

First, up to 100 pay-statements are placed in the magazine of the machine, so eliminating completely the extra operation normally required in handling envelopes or their substitutes.

Then a sheet of loose-leaf wage book is fastened to the clamping device which already holds a double-sided carbon. The vertical alignment with the uppermost laying tax card is automatic.

When the entry across is completed, the figures appear on the wage book, and on the pay-statement. They represent one worker's total wages and tax deductions. This has been done in one operation. The depression of a lever lifts the pay-roll up to the next free line and ejects the pay-statement from the magazine.



Envelopes are an alternative to the insertion of pay-statements, of course, and these are placed in the magazine before operations are commenced.

A positive alignment device ensures that when the next card is placed in the machine, it automatically falls on the next free line of the pay-roll. It is only when a batch of cards is completed that a new wage book sheet has to be inserted.

Reduce Income-Tax Work

It is obvious that the figures on the pay-statements and the wage book sheets are the exact copy of those showing on the tax cards. Once these are checked, the operators know that all other copies are correct.

By simply fixing the alignment device on any of the weeks 1-52, all cards are inserted in the chosen current week, regardless of the position of the pay-roll sheet and every card falls automatically on the next free line after the first entry.

To-day, the employer is responsible for the collection of the income tax of all his employees and there is one more question to be answered. How can wages offices get a receipt each week from the employee?

The problem is easily solved by producing the receipt without any extra work whatsoever. Space is left on an extension of the pay-statement which goes into the machine. This is perforated. The whole statement is seen by the employee when he collects his wages or before it if the organisation makes allowances for this. After checking, the worker signs the perforated portion of the wage-statement-receipt, retains it, and hands it back to the pay-clerk.

Left. The compactly designed, automatically operated self-aligning machine. Below — separated for clarity. The lie-on of the forms shows how the new receipt can serve as a pre-payment check

PAYROLL SUMMARY															NS W/E					
EARNINGS										DEDUCTIONS					TOTAL		NET		NAME	NAT. INS. COYS. CONT.
WEEK	DATE	HOURS	RATE	BASIC	WAGE	GROSS PAY	GRAND PAY	TOTAL TAX	TOTAL DED.	INCOME TAX	INSURANCE	OTHERS	REFUND	INSURANCE	OTHERS	TOTAL	NET			
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WEEK	DATE	HOURS	RATE	BASIC	WAGE	GROSS PAY	GRAND PAY	TOTAL TAX	TOTAL DED. <th>INCOME TAX</th> <th>INSURANCE</th> <th>OTHERS</th> <th>REFUND</th> <th>INSURANCE</th> <th>OTHERS</th> <th>TOTAL</th> <th>NET</th>	INCOME TAX	INSURANCE	OTHERS	REFUND	INSURANCE	OTHERS	TOTAL	NET			
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The Sales Manager Can Help the Salesman To Help the Firm

By JOHN MCCREESH

"I pay for results!" exclaims the irate executive, "if they are not forthcoming—I'll find someone else." And another browned-off salesman bites his lips and walks from his manager's office, more despondent than ever.

With the spectre of unemployment looming before his mind, he seeks what comfort he may in the "Golden Ball" where he spills doses of liquid courage down his neck until his tongue is loosened sufficiently to express his outraged feelings.

"What does he know about selling. . .?—the bloated so and so . . . sitting there drawing a fat cheque every month and never sold a thing in his life . . . ! Bluff! that's all it is . . . he's full of it and his own importance."

As the night goes on the disgruntled salesman advertises to his friends and listeners the incompetence of his manager; his utter inability to understand salesmen, and the blindness of the company employing him. Of course, he also reveals his own folly to his amused listeners.

Many things are wrong here, and the chances are that this representative, unless he turns around and subjects himself to an honest examination, will drift and slip down the precipitous slope to failure. Whilst that "someone else" whom the irate manager seeks, will never turn up, at least, not to achieve any permanent degree of success with him.

Now it is quite true that a salesman's attitude towards his customers reflects, to a great extent, his relationship with the company employing him.

The relationship between the company, the salesman and the customer, therefore, must be no superficial pretence but harmonious and real, based upon an earnest desire to serve. That lukewarm interest which some companies pretend to envisage in their salesmen; those genuine grievances and misunderstandings which are not dealt with, but allowed to drift on, will create doubts in his mind, soon resulting in loss of confidence, eventually leading to inharmonious relationship with his customers.

It is therefore the responsibility of the company to see that this state of mind is never allowed to arise and thus weaken the salesman's efforts.

Happily many firms now realise that the day of hit and miss methods, and the hail-fellow-well-met—who sauntered leisurely around the shops and warehouses—is over. Scientific salesmanship is developing, and will grow, as the need for well-trained salesmen to-day is vital, if we, in this little island, are to obtain our share of the World's markets.

Now if a man is chosen to be trained as a salesman and is not to become a square peg in the proverbial round hole, his fitness to carry out such duties successfully, should be made apparent to the company.

The salesman must analyse himself and answer these questions honestly. "Have I a sound knowledge of my job and the articles I sell? For knowledge makes for efficiency." Secondly, "Am I enthusiastic about it and sincerely want to progress in it above all others?" In this "feeling" for the job, lies service. Thirdly, he must answer "Have I the 'will' and urge to work and carry it out—to act with determination?" Here is the impetus and drive to achieve success.

It is often said that salesmen are born; this applies to almost every job under the sun. The men born, with this natural flair for their jobs, are few, and it often happens, that the well trained man who works hard will surpass the indolent genius.

Value of Self-confidence

The successful salesman knows what attitude of mind to create in a prospect's mind if he is to obtain results.

The prospect must know what is being offered to him, that is to say, the salesman must educate his prospect and do so earnestly and with enthusiasm until the buyer understands what he is being offered; no question must be left unanswered to rankle in the prospect's mind, perhaps to blur an otherwise clear picture, and thus prejudice the chances of a sale.

Secondly, the salesman must sell himself and create confidence between himself and the buyer.

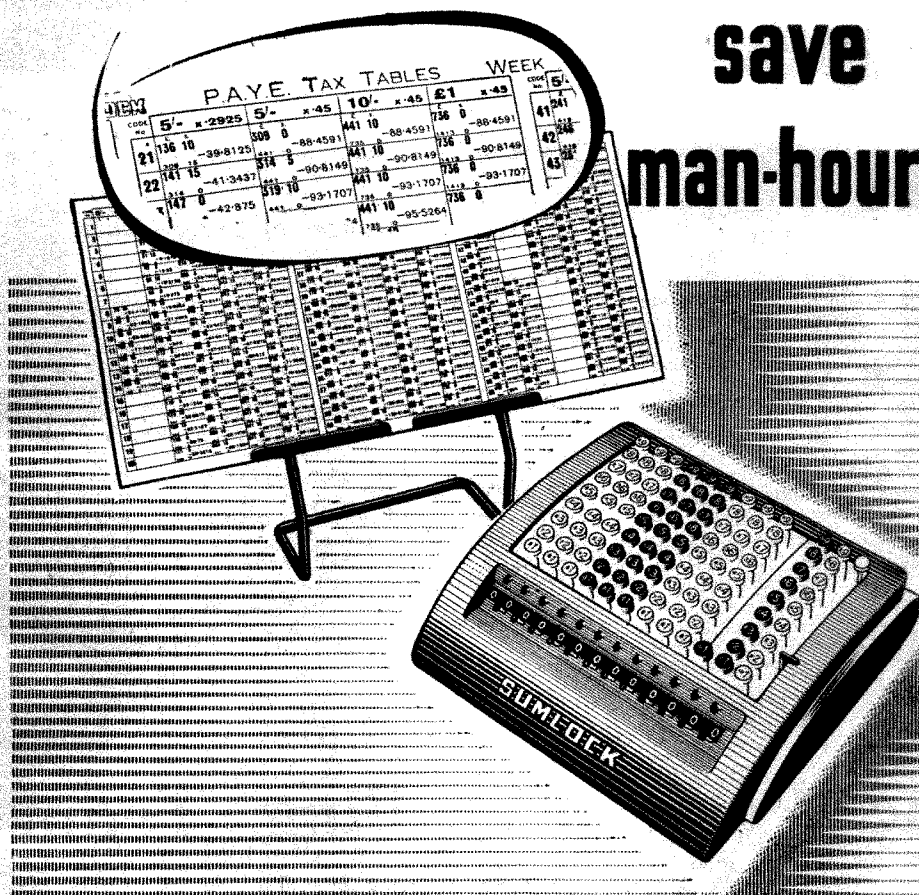
Thirdly, a desire to possess the goods must be aroused in the prospect's mind.

It must be clearly understood, however, that these three aspects of a prospect's mental reaction to the salesman and his goods, this state of knowing, feeling or confidence, and desiring are inseparable and indivisible; all three form one unitary experience. They are in fact just psychological abstractions and have been selected so that we can distinguish each aspect for the purpose of analysing and studying them in relation to our job.

The third aspect of this trinity—a desire to possess the goods—should follow automatically if the salesman has succeeded in accomplishing satisfactorily the other two. That is, succeeded in gaining the prospect's confidence and impressing him with the quality and utility of his goods.

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But if his efforts have been weak, for example, should the prospect lack confidence in the salesman, or take a dislike to him, then, provided competitor goods are available, no amount of selling talk, or barrage of words and stock phrases—which often result in talking himself out of a sale—will compensate for this lack of confidence, which must be restored.

Again, if the buyer does not understand what he is being asked to buy, or the salesman has not succeeded in radiating earnest enthusiasm, then neither the charm of his personality, nor those doubtful aggressive tactics which sometimes compel a decision, will bring that happy and permanent result so desirable. If the job is properly done, he'll have made a friend as well as a customer.

This is but a general outline of the state of mind created by a salesman's approach to a prospect, and allowance must be made for those cases where one aspect predominates over the other two in the prospect's mind. For instance, we've all met the man who, owing to an attack of liver or some glandular trouble, freezes you with a look. His "feelings" are such that he dislikes all and sundry; if you give him something he'll still dislike you. Other aspects too, may predominate but generally speaking, we have a basis here upon which to build. If our efforts to sell meet with failure, an honest examination of ourselves will help us to profit by our mistakes. Take each aspect; project it; find out where the mistake or weakness lay; rectify it, and go ahead.

A word here, with reference to the application of the "ART" of selling, will help to eliminate that artificial self-conscious feeling, and correct

that garrulous babbling fellow we've so often met.

Having studied his art, the salesman must then proceed to conceal it. It was Wilde, himself a great actor, who said "The highest art of the actor, as of every other artist, is to conceal his art." These words apply just as much to the salesman as to the actor. He should practise his art until, like the successful violinist, who forgets his fingers and concentrates upon tone and effect, he is able to concentrate upon a positive result, radiating confidence and earnest enthusiasm which, Emerson says, "is infectious."

Danger of Long Hours

How closely interwoven, then, is the relationship between the company and the man "on the road." How necessary it is to see that their relationship with each other is sound. That he has a thorough knowledge of his job and the articles he sells. That the conditions under which he works are favourable, and that he gets every support and encouragement to use his initiative.

Any sales manager who has spent a little time on the study of psychology knows that a salesman lives on his nerves, and there is always a danger that long hours of intense concentration and emotional strain, will crack him, and erratic results will appear.

A company employing salesmen should take cognizance of this and when erratic results appear, this possibility should be borne in mind.

Please turn to page 78

How to Build Up The Postwar Selling Team From Scratch

By V. HAWKE

IT is still a sellers' market. For the greater part of to-day's range of commodities that is still the essence of the situation, and perhaps there are too many firms who regard it as an adequate excuse for not toning up their selling organisation, which has inevitably become a stunted organ during the war years. Certainly, to firms which have never conducted the sale of their goods to retailers through direct channels, the present does not appear a good time in which to embark upon a change of policy.

Such firms would argue, and with apparent justice, that since they have no difficulty in disposing of the goods which limited labour and materials enable them to manufacture, there is no very adequate reason for the creation of their own sales force as an alternative to dealing through wholesale distributing houses.

This attitude, I believe, is profoundly wrong

It is a characteristic of living for the present and leaving the future to care for itself. That is a policy which never succeeded for long in business.

There is ample precedent for saying that when selling is an easy task preparations should be made for the day when it becomes a matter of high pressure salesmanship to dispose of normal output.

Such a day may not be too far distant, and it is well worth the time of any board of directors hitherto dependent upon the service of wholesalers to consider the merits of selling direct to the retailers.

The policy of branded goods has been tried and found effective in a variety of spheres of merchandise. But to make it fully effective as a fillip to sales, direct association with the optimum number of retail outlets is to be advised.

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For this there are a number of reasons. Firstly, the retailer knows his original supplier personally and can transmit to him his knowledge of variations in market potential, at the same time making suggestions from which the manufacturer can profit. Secondly, the manufacturer can be assured of the size of his market in advance, without being dependent upon the piecemeal and often intermittent orders placed by wholesalers.

This is not to say that the wholesaler has no function in present-day distribution. It is, however, to argue that in some lines, particularly if they are sold under a branded trademark, the wholesaler is not the best medium for reaching the retailer. Manufacturers will know best themselves whether the argument fits in their case; and if it does, they may be aided in the creation of their own sales organisation by the experience of a firm of textile manufacturers during the last twenty years.

At a time when home manufacturers of textile goods have suffered from a more or less sustained depression, the sales graph of this particular firm has shown an ever upward trend. This success is to be ascribed in no small part to a decision taken twenty years ago to get nearer to the ultimate consumer by instituting a sales department that would send representatives throughout the land and create an organised liaison with shops and stores of all sizes and kinds.

School For Salesmen

In the first place, they gave a guarantee of quality as an essential adjunct to their brand name; and they honoured every complaint by a customer, whether justified or not, in order that their reputation should be maintained beyond all question.

With that guarantee as both banner and sword, they engaged from outside their industry a sales executive who knew little about textiles but a great deal about the art of persuading people to buy goods.

It was the task of this executive to draw sales representatives from whatever walk of life in which they could be found. Like him, most knew little of the kind of goods they were to sell when they were recruited to the organisation. So much, he believed, the better. For they had no preconceived notions to dispel.

Even more, most of them had no experience of selling goods of any kind. Again, he believed, so much the better; for from the very outset they could be instructed in the methods by which the firm desired its goods to be sold.

In order so to instruct them the firm created its own school for salesmen. The task of its tutors was not to initiate them into the arts of bluff, bullying and blackmail. It was to equip them with certain rudimentary facts concerning the products they would be handling, together with a simple but adamant sales ethic.

Of the goods themselves the salesmen were told sufficient from the technical standpoint to enable them to meet without disadvantage men conversant with such goods the whole of their lives. More important perhaps, they were thus enabled to answer with effect and accuracy any

questions concerning the goods which may have been troubling the retailer or his customers.

When they went out on to the road, the salesmen were given a specific list of firms upon which they were to call, and the intervals at which they were to call upon them, the latter being determined by the volume of business transacted in each instance. Each time they made a call they had three jobs to do. And three jobs only.

Three Jobs Only

(1) To interest the retailer in one line which hitherto he had not handled, and it was to be only one line. If he was not interested that was the end of the matter, and the salesman would pass on to his remaining two functions. He would *not* parade a host of new lines in the hope of intriguing the customer in one or more of them. Similarly, if interest were evinced in the one new line selected, the salesman would do business on that basis and again pass on to his other functions without further ado.

(2) To check over with the retailer his existing stock of the manufacturer's goods, with a view to discovering what deficiencies needed to be made up. This acted as a periodic stock-taking which retailers came to value as time went by, knowing that by means of this regular check-up they would be saved from ever running dangerously low in supplies.

(3) To invite from the retailer any criticisms, questions, or suggestions. This, while enabling the manufacturers to be constantly in touch with the views of the ultimate consumer—that is, to have their own widespread, if unpaid, market research organisation—also enabled the retailer to feel that he was being given a personal attention and a specialised service which would not normally have reached him through wholesale channels.

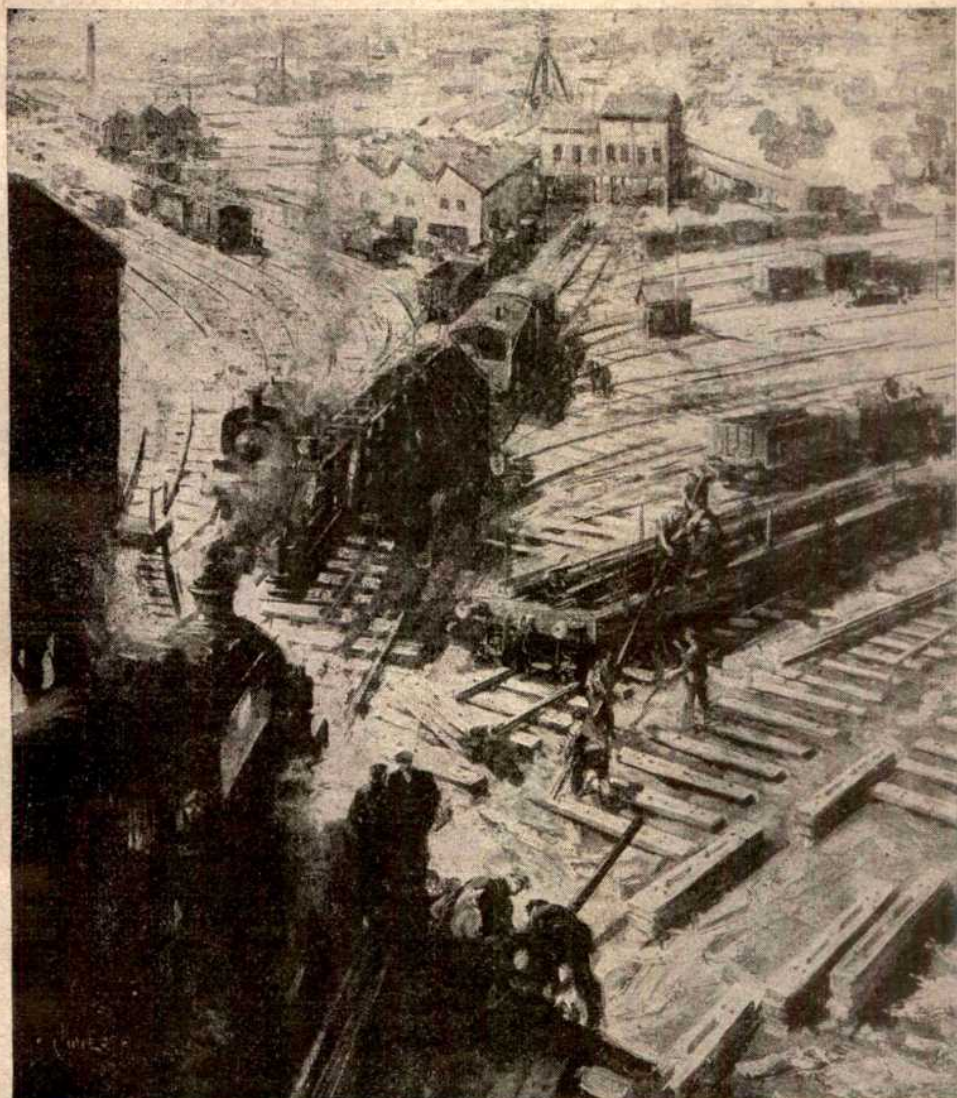
In carrying through this simple but effective sales policy, the representatives of the manufacturer were assisted in one further important particular. The prices of all goods, both wholesale and retail, were fixed, and no departure was made therefrom in any circumstances whatever.

Large stores might buy in substantial quantities, small shops in comparatively small ones, but to both the terms of trading were identical. There were cases where large retailers sought preferential rates and conditions; they wanted discounts and exclusive selling rights in their districts. They were refused, and in time the guarantee of quality that backed the products was itself a sufficient inducement to them to open business with the manufacturers if at first they had declined to do so.

While, however, the manufacturers were prepared to deal with any firm, large or small, providing the public was served, they did insist that the conditions under which trading occurred were such as to attach no discredit to the goods themselves. Shops, that is, had to be pleasant and convenient from the shoppers' point of view.

To-day, many servicemen possessed of initiative but no selling experience are seeking new outlets for their talents. Was there ever a better time to consider the creation of your own sales organisation along these lines?

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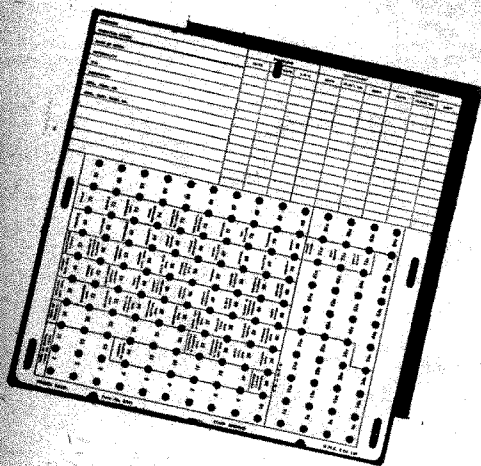
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Group Method Cuts Exports Costs.

EXPORT Group Selling, so often advocated by industrialists as being the most efficient way of handling overseas markets for British products, is taking shape. Mr. L. G. Adams, who has written articles on Group Selling for this journal and is now managing director of an export company actively engaged in the formation of groups, tells me that the prospects in this field of business are most encouraging.

Mr. Adams' firm acts as export managers for various manufacturers whose overseas business does not warrant the heavy expense entailed in running an export department. In many cases their products have the same or similar point of sale; but although uncompetitive, methods of sale, advertising and distribution are the same. Thus an export service is provided covering every aspect of the job.

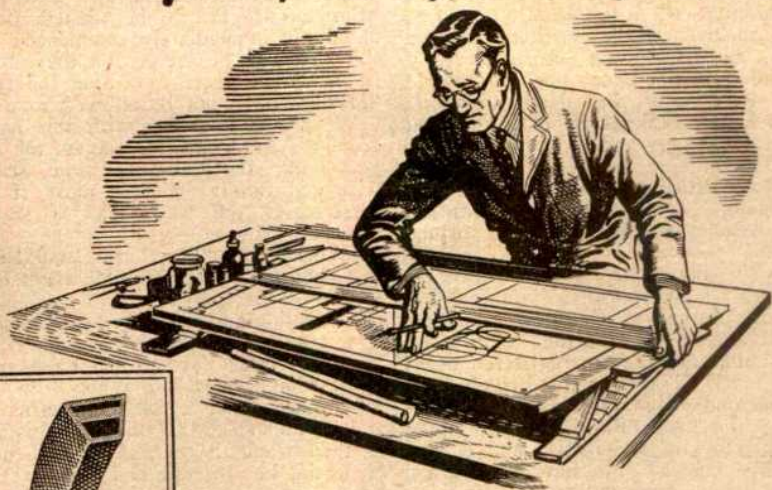
Building materials provide a good example. There used to be a heavy demand overseas for steel windows, decorative finishes, builders hardware, etc., but these are now manufactured in the Dominions and other pre-war importing countries. Although the demand at present far exceeds the supply, the time will come when these markets will draw a very considerable part of their requirements from local manufacture. Moreover, many importing countries are pledged to protect and encourage local industries by higher tariffs and other restrictions.

It is, therefore, on specialised products that we must concentrate to make up for the loss of bulk business—the turnover of one big manufacturer must be made up by the smaller turnover of many. In each case the sales and distribution must be carried out as widely and as efficiently as before. Contact with architects, builders, builders' merchants, municipal and government authorities by trade ambassadors with knowledge of the product and the market cannot, in Mr. Adams' view, be carried out by one firm alone. He believes that the co-operative or group method is the best way of solving the problem economically.

AN interesting corollary to Mr. Adams' opinions may be found in Dr. Edward L. Lloyd's recent address to the Incorporated Society of British Advertisers. Dr. Lloyd described the uses of marketing research in the planning stage, the policy-making stage, and the operations stage. He divided the methods of all research into seven steps: (1) statement of problem; (2) determination of facts needed; (3) collection of data; (4) available and original analysis; (5) interpretation; (6) conclusion; (7) application.

Deploping the lack of a census of business in the United Kingdom, he said unreliable studies caused harm to both practice and practitioner. Sampling was essential, and it was not necessarily the size of the sample that counted, but the care that went into picking the sample. The

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greatest need in marketing research was the elimination of pseudo-scientific, haphazard and opportunistic methods. Some so-called research was only a desire to obtain data, regardless of quality, from the most accessible source. Examples of this were determining consumer preference by interviewing students only, interviewing one income group, or interviewing people in one city size.

Dr. Lloyd summarized the function of marketing research as distributing effort correctly, separating the profitable from the unprofitable, determining price, improving dealer relations, revealing marketing weaknesses, helping improve products and packaging, and providing advance warnings. Altogether it is not surprising that his case for marketing research was described as "unassailable." I believe the same can be said of Mr. Adams' case for Group Exporting.

A CHEERY news item with which to conclude. The Philco Radio and Television Corporation of Great Britain Ltd. under its old agreement with the Philco Corporation of Philadelphia, were registered users of the trade mark Philco for the British Isles only. Exports under this agreement were prohibited under the name Philco or any other name. The directors of the British and U.S.A. companies have entered into new agreements whereby the British company is now free to export radio and television receivers under the trade mark Airmec or any other name except Philco. As before, these products will be sold in the British Isles under the name Philco.

HELP THE SALESMAN

Continued from page 72

If good human material and, most of all, good salesmen are not to be wasted, investigations should be immediately commenced and should this prove to be the reason the salesman must be rested or given a routine job for a while. "Matters must not be allowed to drift."

We are all familiar with this nerve strain; from the tired business man to the fellow who gets home and splits the atom, scattering his wife and family. But in most, if not all, of these cases, the reason can be traced to unbalanced living.

"Work hard", "Play hard", and "Relax", all in due rhythm, would eliminate a number of such victims of nerves.

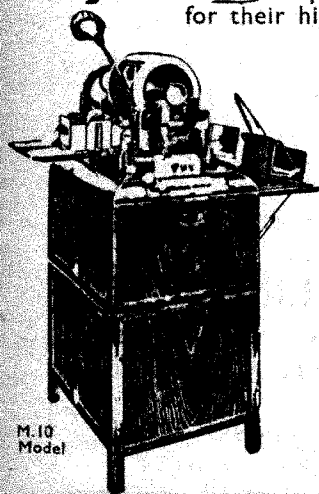
Relaxation and its value as a tonic for nerves is not fully realised or appreciated, and few people in these days of rush and strain really know what it means to relax.

But the sooner a salesman learns the better, and he must learn to throw off his job just as he throws off his coat, so that when he puts it on again, he is fresh and eager for new conquests and higher achievements.

By knowledge and understanding, the sales manager will find the man he seeks, and the man, the manager who will get the best out of him.

In Use Throughout the World

Ellams Duplicator appliances are known throughout the world for their high standard of manufacture.



M.10 Model

The M.10 Automatic Electric self-feeding Rotary model will reproduce perfect copies of any document required at the rate of 40 to 120 copies per minute.

Speed, Economy and absolute precision of work are outstanding features in its manufacture.

Supplies of these appliances are still restricted, and users will be well advised to preserve the life of their present duplicators—any adjustments can be made by Ellams.

Ellams

DUPLICATOR CO. LTD.

Used by Government Departments and large industrial concerns throughout the world.

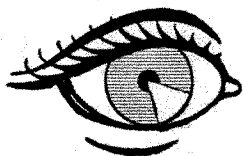
Astor House, Aldwych, London, W.C.2

Alexandra House, Bushey Hall Road, Watford

'Phone: Holborn 5365; and

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BRANCHES IN PRINCIPAL TOWNS THROUGHOUT GREAT BRITAIN.



this change may take several seconds



IF ONE PART of a repetition job is in light and the other in shadow, the worker's eyes must make this focussing adjustment thousands of times a day. If adjustment is slow—and with some people it may take many seconds—work slows down and its quality is endangered . . . OSRAM Fluorescent Lamps provide shadowless illumination; their cool temperate radiance is the next best thing to daylight itself. Eyes are not wearied with constant readjustment, output increases, quality of work improves . . . and incidentally current consumption goes down, because an 80-watt OSRAM Fluorescent Lamp gives three times as much light as a tungsten lamp for the same amount of current.

Stocks available at all G.E.C. Branches

Osram

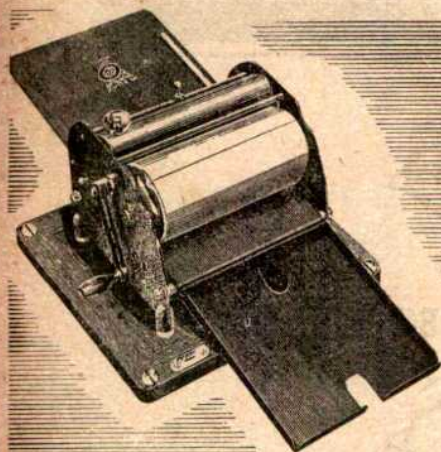
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LAMPS

DAYLIGHT and WARM WHITE



A Revolution in DUPLICATING



Change . . . that is revolution. Change from one form to a—generally—improved form . . . replacing the old with new and better ways of doing things. That is why Banda Duplication is revolutionary.

**NO INK—
NO STENCILS—NO GELATINE**

For short runs of all types of office or internal forms, stock lists, price lists, memos., sketches or diagrams, the Banda Spirit Duplicator is ideal.

An officially appointed Banda Agent in your area can demonstrate and provide complete service after installation. Write or phone for full details and address of nearest agent to Dept. B.



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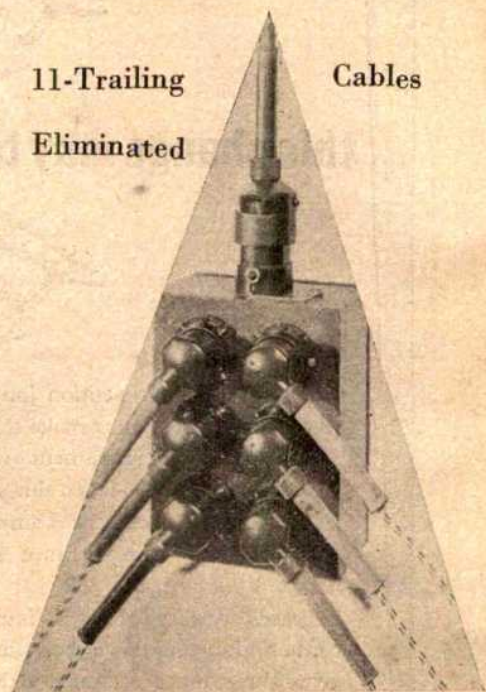
INDUSTRIAL PRODUCTION EQUIPMENT

new *For the Factory*

11-Trailing

Cables

Eliminated



THE double-pole multiway metalclad plug-couplers here illustrated eliminate the necessity for a multiplicity of separate trailing cables, and are ideal for feeding a number of lighting or power points from a single remote supply-outlet. Manufactured by A. Reyrolle and Company Ltd., they are suitable for either indoor or outdoor use and the units can be attached to posts or girders or may lie on the floor or ground, as best suits working conditions.

A rectangular metal box has either six 5-ampere or three 15-ampere B.S. 196 outlet plugs and sockets mounted on it, the box being the same size for both ratings. The incoming cable may be permanently connected inside the unit and it then passes through a rubber cable gland and guard or, alternatively, a metalclad inlet-socket may be mounted on the box, and the incoming cable is then connected to a corresponding inlet-plug so that it may be detached for easy storage of the unit. Earthing facilities are provided to ensure safety in handling.

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A few reasons why you should investigate this One Unit Addressing System.

- No expensive, noisy and cumbersome machinery to purchase to be self-contained.
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- Indexograph Address Units are guaranteed to last as long as you need them.
- Over 80,000 users throughout the world.

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No matter what your name or data writing problem may be—ADDRESSALL has the solution.

We have a model to cover every known requirement in the mechanical production of Addressing or Listing work. Hand, Foot and Electrically operated.



11/13, SOUTHAMPTON ROW, W.C.1.

12 Press for Plastics

On the left: the
Turner Press.
Below: Negretti
and Zambra's
Potentiometer.



AS plastics are in the news to-day, there will be general as well as specialised interest in the 50 ton plastic upstroke press which has been brought out by the Turner Manufacturing Company. The essential characteristic of the machine is simplicity, as these details show:

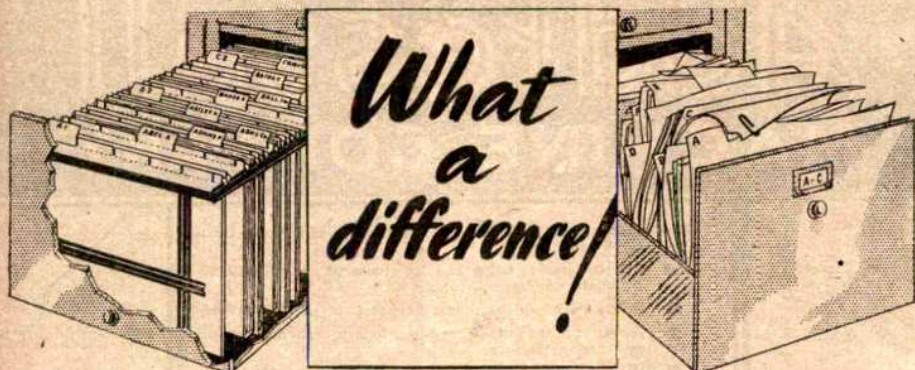
The press is completely self-contained with a sealed unit hydraulic system which incorporates a compact high pressure pump. A single lever controls the closing and opening movements of the press and the speed of the ram in either direction can be adjusted up to the maximum speeds given in the specification.

The pump pressure can be adjusted by a handwheel to reduce the closing force as required down to a minimum of 10 tons. To instal the press it is only necessary to make one connection to the electric supply. Levelling screws are provided.

13 New Potentiometer

ORIGINALLY designed for measuring molten steel temperatures, Negretti and Zambra's quick reading potentiometer is now used also for other metals, research, and general test purposes. The galvanometer has almost a zero period and follows any adjustment of the dial instantaneously, so that the temperature can be read in about two seconds.

The range is 0/53 millivolts, reading to five

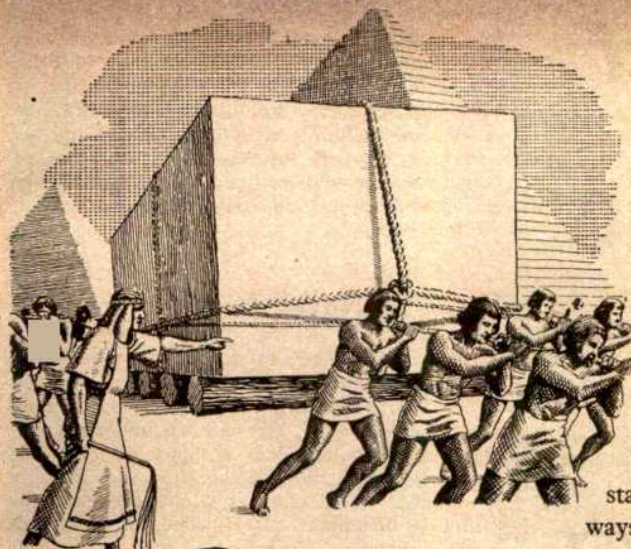


—same cabinet—same contents, but what a difference! A bulging, dog-eared, untidy collection of time wasting files, or Shannoblic Suspended Folders—always in position, always neat and tidy. Large adjustable angled tabs reduce filing and finding time to seconds. Shannoblic fits your filing cabinets and most deep desk drawers, or a small unit is available for desk top use. Send for leaflet showing how Shannoblic can help you.

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ways & means

Human ingenuity overcame the apparently insurmountable problems relative to the construction of the Pyramids. In modern industry many ideas have been formulated but have got no further because the process of turning them into working products has eluded their inventors. GIB has changed all that. If you have an idea which contains a grain of possibility, we have the experience, the staff and the enthusiasm to find the ways and means of making it a reality.



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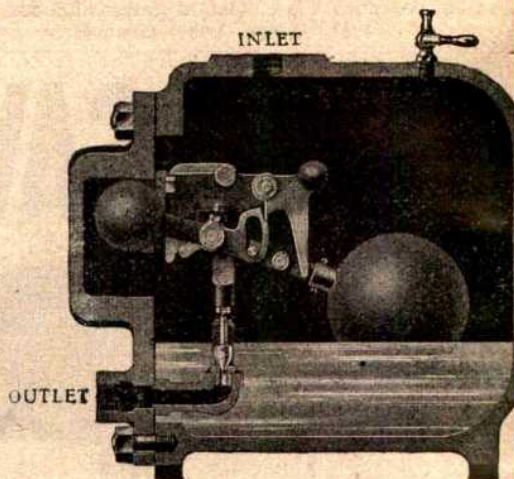
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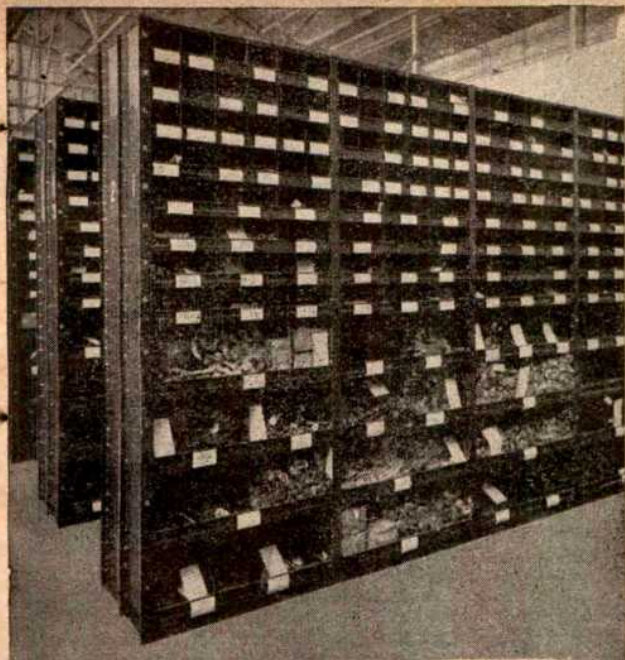
microvolts, with sensitive double suspended galvanometer and internal spotlight system. The galvanometer has a shunt circuit for rough adjustment giving a full scale deflection for 53 m/v. and secondary circuit for final adjustment. A Weston standard cell is incorporated and two accumulators, with terminals for three thermocouples and selector switch. A potential divider is supplied for testing, indicating and recording pyrometers.

14 Novel Steam Trap

SOMETHING new in steam traps comes from the United States Metallic Packing Co. Ltd. Their Bradford Steam Trap and Eliminator is a float trap, but with an important difference. The float does not open or close the discharge valve. It simply releases or engages a weighted lever, which is so arranged that the outlet is instantaneously opened, or instantaneously closed. There is no middle position. This effectively prevents the wire-drawing of the discharge, which cuts the valve and seat, and so destroys the efficiency of those traps where the opening and closing takes place gradually. All engineers will at once recognise the importance of this improvement.



The method of operation is as follows: the water accumulates in the collecting chamber and gradually raises the float until the latter reaches the desired point, when it trips the weighted lever, which immediately opens the discharge to its fullest extent. The water is then forced out under full pressure, until it reaches the bottom level, when the lever is again tripped, and the discharge is at once closed. The outlet is always submerged, so that there can be no escape of steam. The apparatus is made in two types, viz., the piston operated trap and the direct operated trap.



"HARVEY"

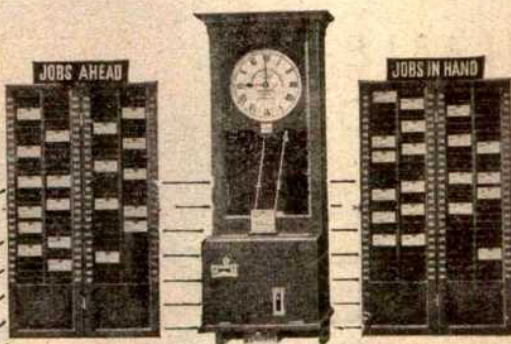
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"HARVEY" Adjustable Steel Storage Bins and Shelving can be arranged to form stacks giving accommodation for small or large quantities exactly as required. NO WASTE SPACE.

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SUPER SERVICE



These special points have established for the "G.B. Clipper" Job Costing superiority of service beyond question.

- NO SHIFT LEVER
- NO SPECIAL MEALTIME SETTING
- NO OVERSTAMPING
- NO RECORDING ERRORS
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At each clocking the "CLIPPER" accurately locates the card for the next occasion irrespective of time signal. This unique feature means maximum efficiency with convenience and a definite saving of time and labour.

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MUCH has been done during the past few years to improve our methods of production. Where, for example, a group of operations in manufacture or assembly used to be assigned to one type of operative, now it is common practice to "break down" a particular group into separate jobs and then train each worker to be a specialist in one operation only. The result is an appreciable increase in individual efficiency and, therefore, in collective output.

This Is the Light for 'Accurate Assembly

By W. GEE

This sub-division, however, has not only been applied to operations and to personnel, but to machinery and other equipment as well. The more modern method of equipping machine with individual drive, as opposed to the old lineshaft and countershaft drive, is a case in point. Especially has this method proved itself where changes in production have involved the re-planning of works' layout.

Then again, it used to be common practice to light a factory not merely with the same type of light source (at one time there was no alternative), but to the same intensity throughout but the evolution of new light sources and a better understanding of their applications to industry have also facilitated production.

Just as the workers and the machines have been subdivided so, too, in similar ways have the various light sources, their associated fittings and illumination intensities been applied appropriately to individual classes of operation.

The following notes, however, are mainly

NOW AVAILABLE—
The New DEED BOX

by
CHUBB

Sturdily built in welded steel these new boxes are fitted with the famous unpickable Chubb Lock, and the Detector Device which reveals attempted tampering.

The modern silvery crackle finish and chromium lock face give these boxes a distinguished appearance.

Now on view at our showrooms and at Harrods, Aspreys, Fortnum and Masons and most of London's famous stores.

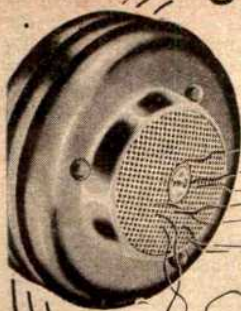


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Also, by using Guide-o-Graph Factory Line Paint (quick-drying and long-wearing) lasting results are assured.

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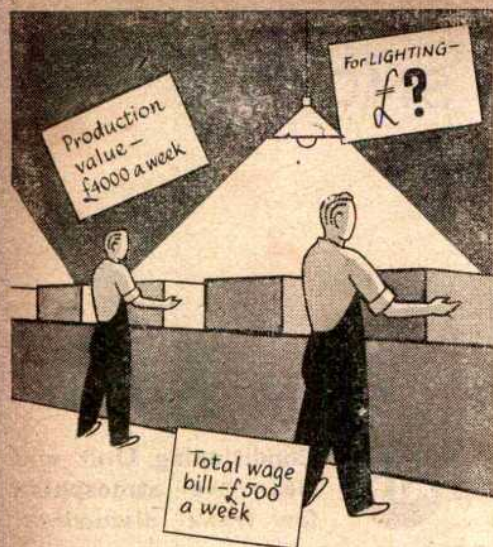
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... but how much should be spent on light to get the best out of men and machines?

Production depends not only on efficient machines and skilled operatives but on the effectiveness of the lighting. Every factory administrator knows for example how production tends to fall as daylight fades. Yet how many have called in a lighting engineer, and asked him to arrange lighting conditions approximating to daylight 24 hours a day. It can be done. Modern planned lighting, as carried out by Siemens engineers, aims to give light where skilled workers need it—and it does. It aims to eliminate interfering shadows—and it does. There's ample proof that Planned Lighting justifies itself over and over again.



FREE ADVICE. Call in a Siemens Lighting Expert today. He will survey existing installations and if necessary, make recommendations for a system of Planned Lighting—without obligation.

SIEMENS

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about certain sections of a factory which are lighted by fluorescent tubes.

The working area illustrated in figure 1 is illuminated by two kinds of lighting: in the background tungsten lamps mounted in dispersive reflectors are used to light an area where comparatively coarse work needing neither high intensity nor high quality illumination is carried out.

In the foreground assembly and test work of fairly fine tolerances are in operation and here lighting of good quality—as shadowless as possible and with a low surface brightness—is essential. Fluorescent tubes are used to provide this and, as the illustration shows, they are mounted, in line ahead, *behind* the working areas of the benches, thus providing good light values on the horizontal and the vertical planes.

A corner of the machine shop in the same factory is illustrated by figure 2. Here the banks of precision milling machines and multiple spindle drills are engaged on machining the various parts of the intricate mechanisms being assembled in that part of the shop which figure 1 illustrates.

Figure 2 also shows the modern tendency for the independent drive of machine tools. Close work (as the stack in the foreground indicates) mostly on materials with a high reflective factor is carried out in this section so that, once again, a low brightness light source is necessary for the maximum reduction of reflected glare. It is significant that fluorescent tubes are used.

Precision work on small machine tools specially designed for the purpose, is carried out in



Coil-winding can bring eye strain and headaches. Best lighting is essential in this shop where electro-medical devices are made

COULD YOU FACE IT?

A bill like this might come at a time when you could least afford it—serious illness usually is unexpected.

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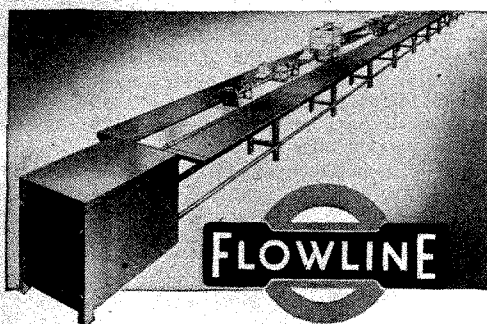
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3 wks @ 7gns			
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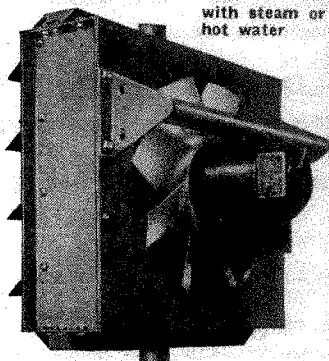
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A LARGE VARIETY OF TYPES AND SIZES are manufactured to meet every kind of heating or processing problem. We shall be pleased to quote.

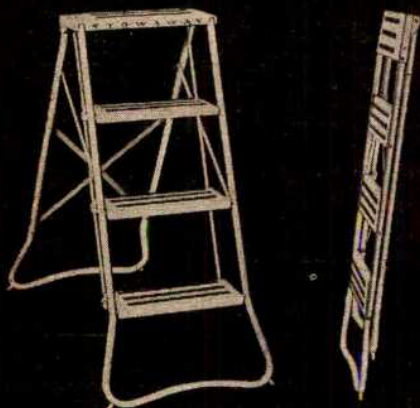
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The lighting here is down low over the work. A cool-burning light sources are therefore essential.

yet another section of, the same factory. Extremely small mechanical parts to fine tolerances is the order of the day here and experience has proved that work of this nature can be expedited considerably by suitable lighting conditions.

In general, a higher value of illumination, glareless and as free from deep shadows as possible, are the principal aims of the lighting engineer in such circumstances. In this particular example, which is shown in figure 3, one other problem had to be solved whilst, at the same time, achieving the other objects. Since only a low mounting height was available the question of heat generated by the light sources needed careful consideration.

One can pretty well visualise how intense would have been the heat and its consequent ill effects on workers—headaches and fatigue—had any light source other than the fluorescent tube been used in this situation. As it is, the heat factor is low, glare and shadow are negligible and the light intensity is relatively high.

A portion of the same factory is devoted to the production of coils for various electro-medical devices. This is "fine" work with the difference that it does not involve working to extremely small dimensional tolerances. Yet, at the same time, it is "fine" work in that the girl operatives are manipulating small gauge black enamelled wire against a black, or nearly black, background.

In addition, the wire travels at considerable speed during the coil winding process and therefore, it is imperative that visual acuity be as high as possible. To achieve this not only is a fairly high light value required, the illumination must be well diffused and, to minimise reflections from the highly polished wire on the core as it revolves at high speed, the surface brightness of the light source must be low.

Photos — Courtesy General Electric Co. Ltd.

"and with regard to LIGHTING ...

I must say the Mazda people were tremendously helpful. Qualified engineers from their Lighting Advisory Service took voluminous notes of the number of people to be employed; the class of work they will undertake; the arrangement of the machines to be installed, etc., etc. Later they submitted the finest lighting plan I have ever known."



**LIGHTING
ADVISORY
SERVICE**

All who are concerned with the installation or renewal of lighting are invited to communicate with our Lighting Advisory Service, Bridle Path, Watford. Phone 5811

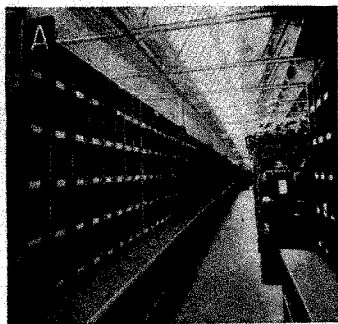


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WITH productive industries, in the last decade the process of mechanisation has developed tremendously. Mass and flow production systems enable a high degree of industrial efficiency to be achieved. Yet in many industries there are still weak links in the production chain. An important link is materials handling. Apart from productive industries, there are a multitude of organisations even more concerned with materials handling and to whom, therefore, the link forms a major part of the chain.

The movement of material in production plants can be effected, to an extent determined by the nature of the material, by conveyor systems laid out to obtain the nearest practicable approximation to a "straight-line" flow. The ideal plant is the one where materials move on conveyors from the time they are received, until they constitute the finished article ready for despatch, and the only handling is on or off conveyors. If this handling is effected by workers, actually engaged in production or inspection, who do not leave their working positions, it is simply a part of the productive

process and no manpower is wasted in merely moving materials from one place to another.

The continuous conveyance of materials is nearly always impracticable since most manufacturing processes necessitate sub-division into individual departments each of which, although operating as a separate entity is dependent upon the others. With good planning a continuous flow of material can be maintained but there are practical limits to the application of conveyor systems, and at some points there must be trucking of materials between departments, and often within each department.

The method of trucking materials through gaps in the conveyor system must be closely watched, for unless it is completely adequate to meet peak demands there may be a rapid and serious breakdown in plant loading. It is comparatively easy to co-ordinate the various processes so as to achieve a specific theoretical production rate, but realisation of the anticipated rate depends upon maintaining the supply of materials. Time lost waiting for materials is a cumulative handicap to production since a lack of material in any part of a mass or flow



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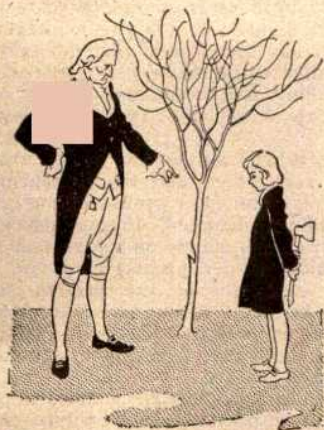
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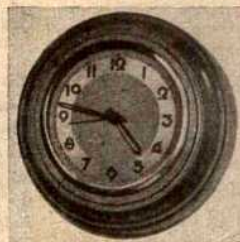
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The benefits of power trucking are exemplified by a case where, before its introduction, forty men were engaged moving material by lifting and hand trucking. To do the same work necessitated only eight trucks which were operated easily by boys from 14—18 years old. Thus, in effect, eight boys now do the work of forty men. It has been found that not only is there a reduction in the manpower required for materials handling, but production is itself considerably increased as the result of power trucking.

production plant results in stoppage of production at other parts.

For this reason it is essential that the method of trucking materials employed should be the one which gives the maximum reliability of service. But at the same time, the cost of materials handling should be kept to a reasonable proportion, and since labour forms an expensive item, the number of workers engaged in non-productive trucking should be kept to a minimum. Experience has shown that in almost every plant where there is a materials handling problem, the requirements are best met by the use of power trucks.

Despite the proved success of power trucking, even in works in which the management pride themselves upon their up-to-date methods, material is still man handled. This is inefficient. It demands strenuous efforts on the part of the operatives which neither profits them nor the management; especially at the present time when there is an acute labour shortage. Meanwhile, labour is expended recklessly in handling material by methods which belong to the early days of industry.

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Outside work too, the electric trucks stands
up to weather as well as hard work

that man handling is the only practicable method; and materials handling has been expedited by the use of stillages and suitable trucks. But there are many works where power handling could be applied to great advantage.

Where handling is the major problem associated with the materials concerned, such as in ware houses, it is even more important to explore the possibilities of power handling applied to the particular requirements. But because handling is the major problem there is every reason to suppose that in most cases power handling can offer appreciable economic and practical benefits.

Nowadays, for materials handling the electric truck is being extensively employed.

The electric truck has the outstanding advantages of being robust, simple to drive and maintain, clean and silent, and very economic to operate. Its simplicity permits driving to be undertaken by an unskilled grade of worker. In fact, many electric trucks are being successfully operated by boys and young women.

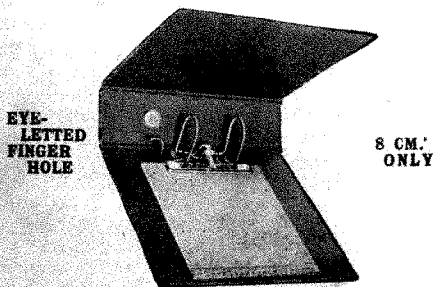
One of Britain's greatest truck builders claims that the life of his product (apart from battery and tyres) may be taken as anything from 20 to 25 years. This long life is largely due to the even torque of the electric drive—there is no reciprocating motion, and consequently no vibration. Also the absence of driving clutches and gear box simplified driving and makes maintenance a very simple matter.

Apart from its inherent simplicity which minimises maintenance costs, the operating conditions are also favourable. The torque characteristics of the electric motor are such that its pulling power is greatest when stationary at the instant of switching on. This is when the maximum pull is actually required; so that as the maximum torque is exerted immediately current is applied to the standing truck, it gets away quickly from rest even when laden or on a gradient. The uniform torque of the electric motor also ensures smooth as well as rapid acceleration.

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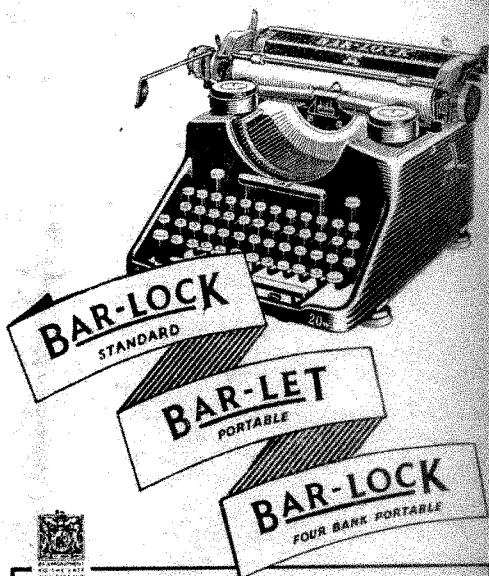
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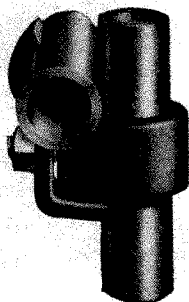


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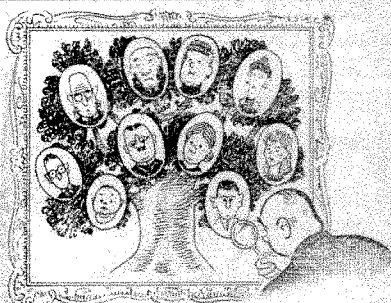


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sure an immediate start even if there is some gumming-up of the bearings due to low temperature.

The smoothness of operation not only minimises maintenance costs, but also ensures that it is seldom out of service for attention. Its ability to give almost continuous service is highly economic since it will be readily appreciated that a truck out of commission for a few days may easily involve the management in serious loss.

The cost of spares for the replacement of worn parts does not usually amount to more than a few shillings over several years. This is because of the inherent simplicity of the electric truck. Its power unit has fewer moving parts than an ordinary car starter motor, all motion is rotary, with anti-friction bearings, moderate speeds and ordinary temperatures.

In general, the cost of current is very reasonable. With electricity at, say, 3d. per unit, the cost of a full charge of a 1-ton truck with a standard battery is approximately 5d. Under ordinary conditions a normal day's work of about ten miles can be done with one battery charge. This is equivalent to an energy cost of about 1d. per mile.

The most expensive maintenance charge with the electric truck is the necessity for replacing the batteries after a period varying from three to five years. These values are, however, conservative and where mileages are low, or a battery charge is sufficient for two days work

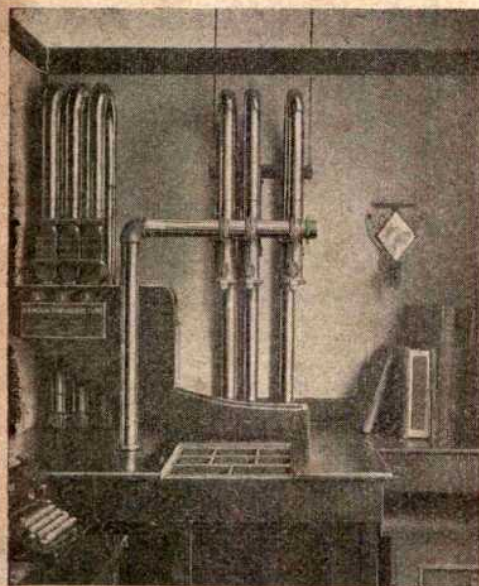
a longer life may be anticipated. Despite the cost of battery replacements, the total operating costs throughout the life of the truck itself still compare very favourably with those of other types of truck.

It emits no fumes or odour, and can thus be used in places concerned with food stuffs and where cleanliness is essential. Even under ordinary industrial conditions the desirability of this feature is becoming more and more widely recognised, since it is now appreciated that efficient production can only be attained by paying attention to the general health of the workers. On the other hand it is equally suitable for running under quite opposite conditions such as in dust laden atmospheres.

A major consideration is whether the power truck is suitable for operation by unskilled labour. There can be no advantage in using a truck which, although economical to run, can be easily damaged by unskilled drivers. If skilled drivers are needed then the running costs may become prohibitively high for certain applications. In practice, mere lads can be taught to drive an electric truck in a few hours. Moreover, since they enjoy driving, they work enthusiastically, and because of their pride in their driving prowess they are no more liable to mishaps than adult drivers. It is, in fact, true to say that the average lad achieves a driving skill exceeding that of much older men.

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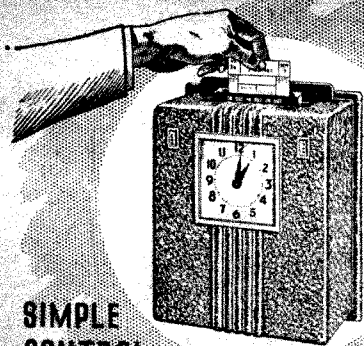
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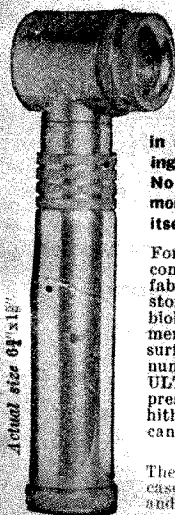
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drivers, the simplicity of the electric truck makes it practicable to use production operatives for the movement of materials with which they are directly concerned.

Alternatively, the truck drivers can be employed in a dual capacity. In general, almost any of the workers, both men and women, can easily be taught to drive an electric truck in addition to other duties. This has the psychological advantage of offering an occasional relief to other monotonous duties. Moreover, a number of drivers are available to meet requirements.

In general, whenever practicable the most efficient handling will be based on the use of stillages with elevating platform trucks. Much unnecessary handling and rehandling of materials can be avoided by the correct use of properly designed stillages. Stillages can be designed for a particular industry, or even a particular works. Thus each plant can be treated according to requirements and this makes for the maximum efficiency of materials handling since there is no question of applying a ready made stillage to a handling process involving special features.

A most successful application of stillages results when they are used right throughout the works from the moment that the materials arrive until the finished goods are despatched.

Although, in general, stillages should be used whenever practicable, certain requirements are best met by fixed platform trucks used either

singly, or in conjunction with trailers.

The introduction of electric trucks as a substitute for manhandling usually leads to the development of special production methods which become practicable only as the result of employing the trucks.

The time saving effected by the use of electric trucks cannot be too strongly emphasized. The average man can move manually about 20 cwt. at a speed of just over 1 m.p.h., but the powered truck will carry up to 2-tons at an average speed of 4½ m.p.h.

Moreover, even when the truck is carrying a load light enough to be moved manually, the time saving factor is still advantageous. Comparative tests over a distance of 460 yards, through a works on a route that involved turning narrow corners and negotiating congested passage ways, showed that the time taken with manual trucking was 8 mins. 20 seconds, as against 3 mins. 42 seconds with a power-driven truck. It is clear that the saving in time is of vital importance when many journeys a day are involved.

As the result of the time saving both precious storage space and manpower are better utilised. Machines can be fed to capacity; finished products can be instantly transported to storage or despatch centres. The speedy rhythm of movement, which is vital to economical quantity production, is thus maintained.

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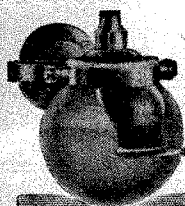
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WHAT I SAW IN CZECHOSLOVAKIA

Continued from page 39

500 or more with 400,647, which is 42.9% of the total employed.

Only the larger concerns are being nationalised, the number of employees being the test and it varies from industry to industry. Private and public enterprise will thus work side by side, and to make it work each nationalised factory is run as an independent unit on commercial lines.

It is not proposed to subsidise the nationalised concerns but to leave them free to carry on without state interference in day to day matters. This means that they will retain independence in foreign trade and this it is anticipated will eliminate bureaucracy and enable trade to continue as formerly.

Latest figures of foreign trade are for October, and show imports at 171,000,000 Crowns or £800,000, which is not high, but shows an improvement over September when only 37,000,000 Crowns were imported. (The exchange is 200 crowns to the £ sterling.) Exports in October were 45,500,000 Crowns compared with 23,000,000 in September.

More than half exports in October were raw materials, the balance being manufactured goods. From May to October largest imports were from Russia with Switzerland, Hungary, Austria and Germany next.

It is understandable that initially Czechoslovakia's trade should be with her nearest neighbours. But as transport improves, customers will increase and her goods travel further afield.

It is a mistake to regard Czechoslovakia as being under Russian domination. Russia liberated much of the country, and it is natural that Czechs should look to her for security reasons.

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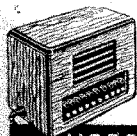
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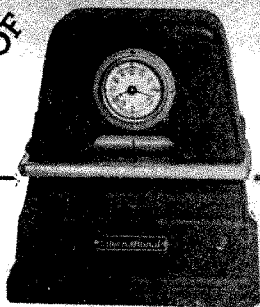


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A trade agreement has been entered into with that country and industrial development is being partly planned to fit into Russia's requirement, but Czechoslovakia has by no means a Communist economy. She desires multilateral trade and has accordingly signed Bretton Woods which her Soviet neighbour has not. In fact, I found some falling off in the early enthusiasm for the Soviet in view of the different economic outlook and in the different approach to political democracy.

I gathered that the Czechs had found that trade agreements with the Soviet work out very differently in practice than in theory. That country's price methods are out of line with world prices and deliveries cannot be made as promised. In fact for iron ore which Russia had agreed to deliver many months ago, Czechoslovakia has had to turn to Sweden as she did before the war.

Czechoslovakia wants economic independence and Britain can help her to achieve it by renewing old trading relations and extending them. We want her goods as much as she needs ours. But happy trade relations rest on good political ones and the situation was not helped by the Foreign Office note of November 22nd last which dealt with compensation for the British owned factories which have been nationalised. Britain asked for payment in acceptable currencies, which meant sterling or hard currencies, and this was resented because it was considered it showed a lack of understanding of the country's difficulties.

Czechoslovakia is no better off for currency than we are, and Britain could not pay out large sums in foreign currency for nationalised industry to-day. Czechoslovakia desires settlement by negotiation on the basis of ability to pay.

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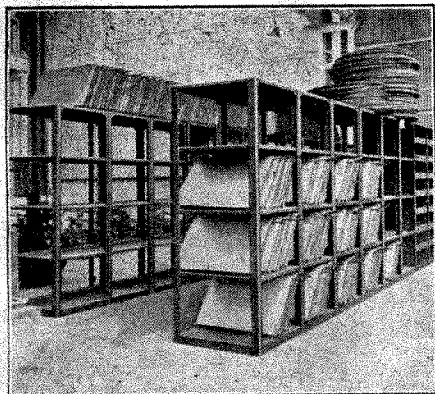
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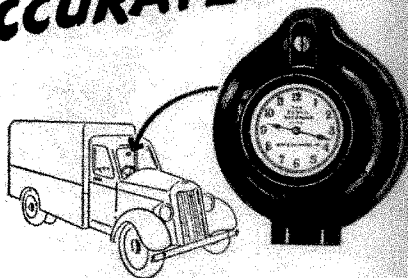
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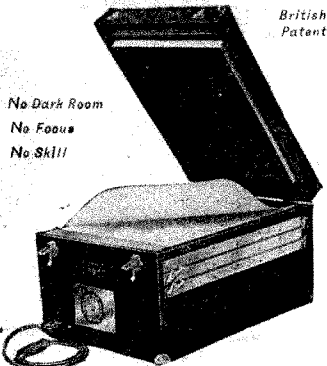
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and when it is practical. Assessment can be made in Czech Crowns and settlement effected in sterling or by exports over a period, say in annual instalments. To quarrel about payments which cannot be made would be very short sighted policy when trade between the two countries would be to the advantage of each.

To trade successfully Czechoslovakia must get her price level in line with world prices and this she is vigorously striving to do. Last year all the money in circulation was called in and new money issued. The old money was held in blocked accounts in the banks and drawings therefrom strictly limited.

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The purpose of this currency reform was to stop inflation and to eliminate the black market. The latter still thrives, but on a declining scale, and the difference between regular and black market prices has considerably narrowed. Prices are still high, and it is estimated for instance that a house which cost £500 before the war would cost £1,750 to-day.

Ten months after liberation Czechoslovakia is well on the way to recovery. Her economic reconstruction is proceeding more rapidly than in any comparable liberated country. This is because of the enthusiasm and determination with which her people are tackling the great problems that occupation left behind.

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Health- in Industry



How to Start a Factory Surgery And Make It a Productive Reality

By SHAUN CLEAVE

WITH the reconversion and replanning of industry many firms are considering the question of starting a Factory Surgery. The official Industrial Welfare Orders, 1917-1921, stipulating that for every 150 persons employed there should be at least one suitably stocked First Aid box and that where there are 500 or more employees an Ambulance room with a trained person in charge must be provided, still hold good. But in recent years many small firms have been so impressed by the obvious advantage of such a department that they have voluntarily included a surgery in their welfare provisions.

The main consideration being one of finance it may be helpful to discuss here ways and means by which the small firm can equip and maintain an efficient work's surgery without undue initial outlay or maintenance costs.

In the case of the large firm there is no problem involved. A factory surgery is obligatory because of the large number of people employed and the services of a full or part-time Medical officer are almost certainly necessary.

Something equivalent to a small hospital unit is planned and run by experts and the cost can be borne with equanimity. But let us suppose that you are an employer of about 250 people of both sexes and that you have decided to have a surgery in your factory.

Up till now all First Aid treatment has been undertaken by twelve of your employees all of whom have had St. John's Ambulance training. They have used the various First Aid boxes distributed round the factory and you have had little cause to complain of their efficiency in dealing with the minor accidents sustained by their fellow workers.

But now you have decided that it would be

more satisfactory to have a special department to deal with all work's accidents and health problems in the factory. In safeguarding the health of your employees this department would work in close co-operation with your shop foreman and would be directly responsible to you as part of your administrative staff.

The first essential step is to select a suitable room for the surgery and for this the following may be taken as a useful guide to one's requirements:—

1. It should be easily accessible from all parts of the factory.
2. There should be some privacy of entrance and exit. The surgery should never open directly into or from a workshop, but preferably from a corridor.
3. The room should measure not less than 100 square feet and preferably about 200 square feet in area.
4. The room should be light and airy.
5. It should be situated in a reasonably quiet part of the factory.

These then are the basic requirements of such a department and many firms will find that they have a suitable room which can be quite easily converted into a useful surgery. The wall decoration is best carried out in some washable paint of a restful colour such as pale green. Half-tiled walls are admirable if initial expenditure permits. The floor covering can be a good linoleum, rubber composition or parquet, all of which are easily washed or polished.

The room should contain a deep, good-sized porcelain sink complete with stainless steel elbow taps. The sink should be fitted with a wooden draining board one side and an enamel-topped cupboard the other. There should be at least one lock-up cupboard with shelves for surgical stock and dangerous drugs or lotions, and

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plenty of shelves round the walls for bottles. An enamel or glass-topped table about four feet by two feet from which treatment can be administered and at least two enamel painted chairs for the treated are necessary.

A rest bed or couch for the use of folk suffering from shock or illness is indispensable and if there is no small side room attached to the First Aid room proper this bed should be in a part of the latter partitioned off by curtains.

A separate entrance and exit for the surgery are preferable but not essential. The sketch plan illustrated is intended to give some idea of a model small work's surgery but its layout and amenities are of course open to modifications as circumstances demand. A wall lamp on a movable arm for close examination of the eyes and for the location of skin splinters should be fixed at some convenient spot near the dressings table. If space permits, outside the surgery entrance there should be a bench or several chairs for those who may have to wait before receiving treatment. The surgical and other equipment including drugs may be wisely left to the choice of the trained person who is to take charge of the department.

Having prepared the surgery up to this stage the next and probably most important step is to select a competent person to manage it. We will take it for granted that you yourself have a really positive attitude towards the whole question of welfare and consequently aim at providing something more than mere First Aid treatment from your surgery.

You need someone therefore who in addition

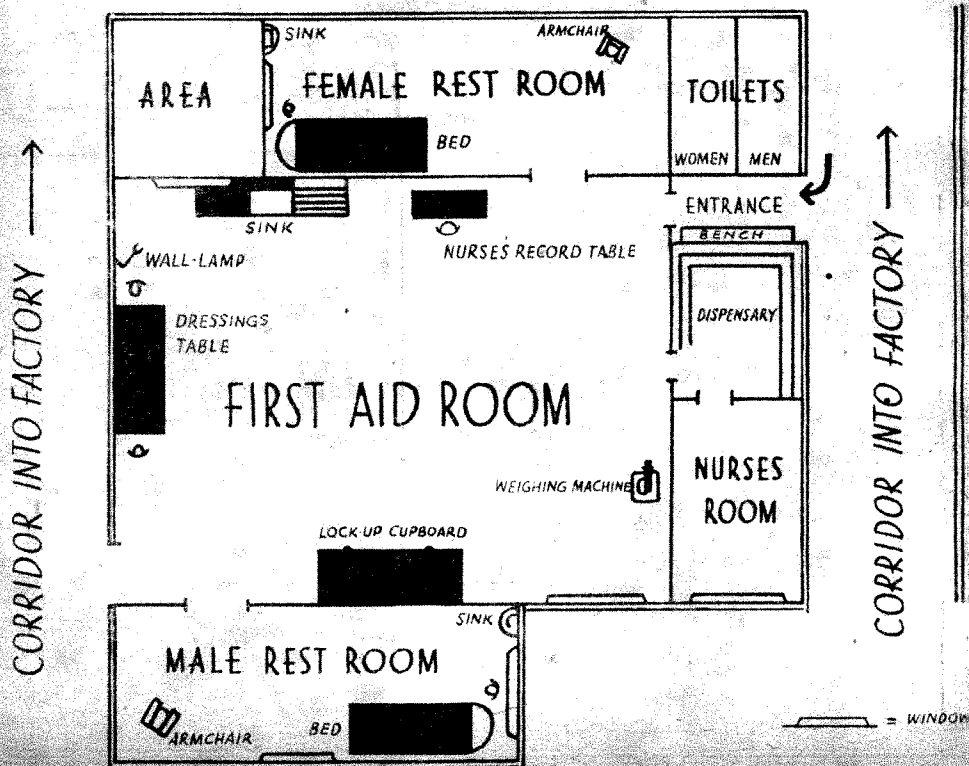
to treating minor work's accidents and simple illnesses can also recognise any case which requires further medical skill and advise accordingly.

In addition to some medical skill the work demands a high standard of dignity, tact and good plain commonsense. In fact, the qualifications required are fairly wide and there is no comprehensive scheme of training which can be said to give them all. However the General training for nurses is fairly comprehensive and the Royal College of Nurses provides special training courses in Industrial Nursing for State Registered nurses and many firms now apply directly to the College for work's surgery personnel. Nursing is by tradition a feminine occupation but there is no reason why male nurses should not be employed in factories where men only are employed.

Make Nurses' Duties Clear

When interviewing your applicants for the post of Factory Nurse it is a wise policy to be perfectly frank about your welfare policy in order that she may understand the scope of her future work.

You may say for instance that the firm is not yet in a position to sustain heavy maintenance costs of the surgery and ask for her co-operation in keeping both overhead and supply costs as low as possible for a few months after which the position can be reviewed. Her own salary should vary between £250-£400 according to her qualifications and the amount of welfare work



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which she is able to undertake. At this point it might be useful to make a brief survey of the field covered by a comprehensive industrial welfare scheme.

Comprehensive Industrial Welfare

WELFARE.—Employment, absenteeism, placing of people in suitable occupation.

HEALTH.—Protective clothing, cloakrooms, rest rooms, First Aid boxes, Ambulance room.

MEDICAL SERVICE.—Health records and research, dental and optical service, sick visiting, convalescence in rest homes, canteen, lighting, heating, ventilation, sanitation, creches for the children of women employed in the factory.

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CO-OPERATION.—Complaints, work's committees, work's magazines.

THRIFT.—Saving's Clubs, hospital contributory schemes.

RECREATION.—Sports, drama, social club.

Of course if you are contemplating any big expansion in your factory you will no doubt visualise having a Welfare Department in the future. In the meantime, given the necessary support from the management, your factory nurse will prove invaluable by including a good many of the welfare duties mentioned with her own special work.

When she finds that these duties are interfering with her surgery work it may be possible for a separate Welfare department to be started

with which of course the nurse would co-operate on a basis of equal partnership.

When the nurse has been engaged it is a good idea to take her round the factory yourself introducing her to department heads and the shop foremen. She will be in the special position of serving everyone's interests from her employer down to the shop boys and if she can establish cordial relationships with all the key folk in the factory she should soon win everyone's respect and confidence.

If possible make a point of allowing half-an-hour a month on a certain date for a personal discussion with your factory nurse. At this talk she could present a typewritten monthly report giving statistics of cases treated in the surgery, sickness, absenteeism and so on. She will also have an opportunity of offering any suggestion she has for improvements in working conditions which will benefit the general health of the employees. Her position as nurse gives her great opportunity of observing cause and effect and many little frictions unobserved by the employer or his key staff are made known to nurse.

If with your co-operation these little frictions can be tactfully eased then you are undoubtedly increasing the efficiency of your firm. In many such ways the good nurse will soon justify her position in the works. That which at first was feared to be a liability is soon seen to be a positive asset. The non-productive venture has become the productive reality—a real Work's Surgery!

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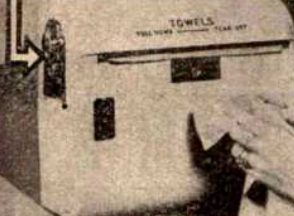
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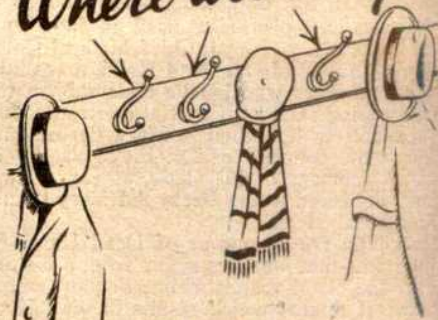
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Threat to Health "Dead Hand" Vibration

IN view of the ever increasing numbers of pneumatic tools being used in industry a paper by Dr. N. L. Lloyd, Chief Medical Officer of Rolls Royce Ltd., on Dead Hand, a condition affecting workers who handle tools subject to a high vibrating rate, is of special interest to business executives and their welfare departments. Through the courtesy of Dr. Lloyd we publish below a summary of his views, as expressed in a paper delivered to the Derby Advisory Council on Industrial Health.

Describing the symptoms of Dead Hand, Dr. Lloyd states that workers suffer from a disturbance of the blood vessels of one or more fingers or parts of fingers which results in the affected part becoming pale and somewhat stiff and clumsy; the sense of touch is lessened; it is not painful. The condition usually lasts only a short while, less than half an hour, and is noted only on the colder days.

The chief causes of the condition are vibration and muscle fatigue. As to vibration, the rate varies between 250 and 6,000 per minute, and according to the recent work by Dr. Donald Hunter, and others, a vibration rate of between 2,000 and 3,000 per minute is more liable to

produce the trouble than rates either higher or lower.

As to muscle fatigue, it will be appreciated that in a tool of the kind under discussion, the handgrip is constantly applied over long periods of time, in sharp contrast to what happens in the case of ordinary hand tools where the grip is intermittent.

Dr. Lloyd thinks it is likely that at the higher speeds a less firm grip is needed. He has observed that among fitters using a tool with a high speed rotary movement some 35-40 per cent of the workmen suffer at times from "dead fingers." Although the condition has not, in his experience, been disabling, it has been a nuisance in some cases. He therefore suggests the following preventive measures:

(1) The temperature of the workroom should be adequate. An initial and working temperature of 60° is the ideal. Where the tool is actually pneumatic the air should be heated.

(2) The work should be done as far as possible at a high speed rather than a medium speed.

(3) Workmen should be taught to use as light a grip as is consistent with safety and accuracy.

(4) That part of the flex or tool which is gripped by the hands should be covered by a buffer of some kind, perhaps of rubber, or perhaps protective gloves should be worn.

(5) Where possible the workman should have an alternative occupation and should change from one to the other frequently.

'GERM-LADEN DUST CAUSES INFECTION

Extract from the MINISTRY OF HEALTH BULLETIN in the Pharmaceutical Journal, 5/1/46.

"The dust problem in the home is reasonably well known to everyone. Much less is generally known of the dust problem in factories . . . Dust and dirt harbour disease . . . In so far as factory dust is just ordinary dirt, factories need regular cleaning in the same way as homes, and the Factories Act requires every factory to be kept in a clean state, accumulations of dust to be removed daily from floors, workbenches, staircases, and passages, and floor to be cleaned at least once a week by washing or other suitable and effective method."

GERMS are everywhere. In dust and dirt they multiply enormously and become the most prolific cause of infection. The simplest and most effective method of preventing infection by germ-laden dust is to combine disinfection with systematic cleaning.

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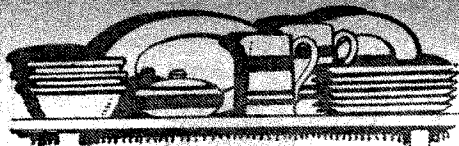
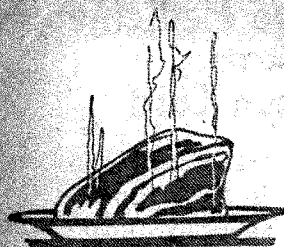
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Preventive Medicine AND THE Common Cold

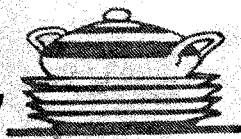
As you know, the medical profession today is turning more and more to preventive medicine. Particularly is this the case where the common cold is concerned—one of the worst causes of lost working hours known to industry. Among the preventive remedies for the common cold BESORBON medicinal snuff has proved remarkably effective. And it has this advantageous feature—it is both simple and pleasant. All that is required for the would-be efficient person to do is, take a pinch of BESORBON once a day during the cold and influenza seasons. By so doing, their nasal passages are disinfected and germs eliminated from the mucuous membrane. Many firms have found that, by distributing a few tins of BESORBON around the office and instructing their staffs in its use, epidemics of colds and influenza have ceased to be a problem. BESORBON does not contain tobacco. It is a scientifically blended remedy based on the formula made by Dr. Hill. It is obtainable in 1/5d. tins from all good chemists, including Boots, Timothy Whites and Taylors. In case of difficulty a sample will be sent on receipt of 1½d. stamp and name and address of usual chemist.

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Improve the Standards and Leave the Name to Uphold Them

By F. A. MOON

of Business Canteen Advisory Panel

MUCH has been said and written on the question of the name "Works Canteen" as opposed to the term "Restaurant". Whilst this subject is not the text of my article, it might be opportune to dwell for a moment upon this thorny point, as a brief preamble to the subject matter.

It is contended by many, that the term "Canteen" as applied to the provision made in factories for the service of meals to employees, gives an entirely erroneous impression to the less well-informed, and it is suggested that a name such as "Restaurant" or "Dining Club", would be a more applicable term.

I venture to say that the term "Canteen" (if implying a comparatively "rough" service in a comfortless building) would be the most appropriate word to describe at least 75% of the cheerless canteens dispensing meals to the masses employed in the factories of this country.

I would go further and suggest that if the comparative few who are responsible for the provision of first class establishments which could rightly be described as restaurants, pursue the policy of endeavouring to uplift the standard by pressing the policy of the general adoption of the term "Restaurant" or "Dining Club", they will, instead of achieving their object, degrade the name restaurant by allowing such term to be applied to the present factory canteen.

How much better it would be to raise the canteen standard and thus ennoble the term "Canteen" to the degree that it could be aptly described as a restaurant, although the latter description would then be hardly necessary.

How can this be achieved? First let us study the difference between a restaurant and what we usually visualise as a canteen. The two can only differ on one or more of the following points:— *a* the building; *b* the furnishings; *c* the decorations; *d* the general amenities; *e* the service given.

Let us proceed to investigate each point, and in doing so, we will consider the normal privately owned restaurant, as opposed to the factory owned canteen.

The building. It is obvious after due consideration, that generally speaking, the building cannot account for any difference. One has but to recall past visits to various restaurants to realise that, although often located in the most unprepossessing buildings, some being found in basements devoid of natural light, they mostly possess at least some modicum of comfort. Their very existence and prosperity is dependent upon the attractions offered.

Schemes for Comfort

The furnishings. Here we usually find a material difference, varying naturally, according to the standard of the individual canteen and restaurant. One can but generalise however, so therefore take a normal canteen against a normal restaurant.

The restaurant may be carpeted, and whilst this would make a tremendous difference in a canteen, it is obvious to all that such a luxury must be ruled out in any but a staff canteen, on account of the quantity of dirt which would be carried in from the factory.

Nevertheless, there is no excuse in normal times for concrete, or floors of bare boards. Lino would not only improve appearances in such cases, but would also provide a surface which could more easily be kept clean.

Restaurants do not accommodate the people who bring their own sandwiches, and therefore there is no litter problem. Canteens could be provided with neat litter containers, painted to match the decorations.

Many canteens have tables of bare boards. Some have forms instead of chairs. Hardly any have hat and coat hooks, whilst few have curtains. These conditions will not be found in

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any medium restaurant and they are points which could be most easily overcome in canteens.

Even if curtain material is not available, excellent effects can be obtained by using black-out material. With bands of coloured braid stitched across, or bright patches of gaily coloured felt cut to floral designs stitched on, some remarkable results might be achieved.

The furniture would be vastly improved in many cases by use of paint. Forms should be entirely abolished and replaced by chairs. Good second-hand ones are now coming on the market, and are available at reasonable prices.

Long tables are typical of many canteens, usually on account of the limited floor area. Where possible, tables to accommodate 4 or 6 persons should be the rule. Here again the time is opportune, for good surplus second-hand tables are now becoming available.

The decorations. There is a notable difference in the decoration of canteens and restaurants. Many factory managements suggest that they cannot maintain a clean decorative effect on account of the proximity of the factory, and the grease and dirt on the clothes of operatives due to the type of industry in which they are engaged. As a result, dull, drab colours are used, if at all.

Paint manufacturers have made great advances over the course of years, and there are paints to suit every need. There is no excuse for drabness, and a little time spent on scheming out a more cheerful atmosphere will be well rewarded.

Needless to say, the lighting effects can be improved in many instances, and one would do well to copy the effects attained in many restaurants, by the mere change over to some new shades or fittings.

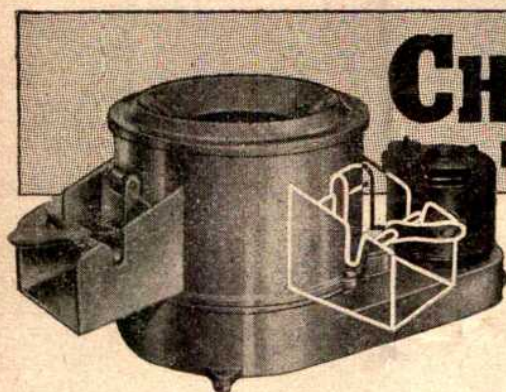
The General Amenities. Cosiness is the essence of comfort. Adequate heat in winter, and ample ventilation in summer should be the aim. Restaurants have open fires in the winter, which cheer the cold and hungry.

Such waste should be avoided, by modern standards, yet I am sufficiently old-fashioned or conservative to feel that it will be many generations before the natural desire to sit by an open fire will be overcome. However, I do not advocate such methods for factory canteens, even if practicable, but there is no reason why the canteen should not be warm.

Some have outer doors leading direct into the canteen, causing discomfort to all, especially on very boisterous days. Wherever possible there should be an entrance hall or passage, with doors at each end, to avoid draughts. The methods of heating and ventilation cover a wide field, and the subject is one which cannot be dealt with here. Suffice it to say that ventilation and warmth run hand in hand in winter, whilst summer requires extraction and a cool intake.

A few pictures on murals on the wall, or the introduction of mirrors, are amenities which make a considerable improvement, with very little effort.

The canteen management might, in many cases, give a little more attention to the dining-



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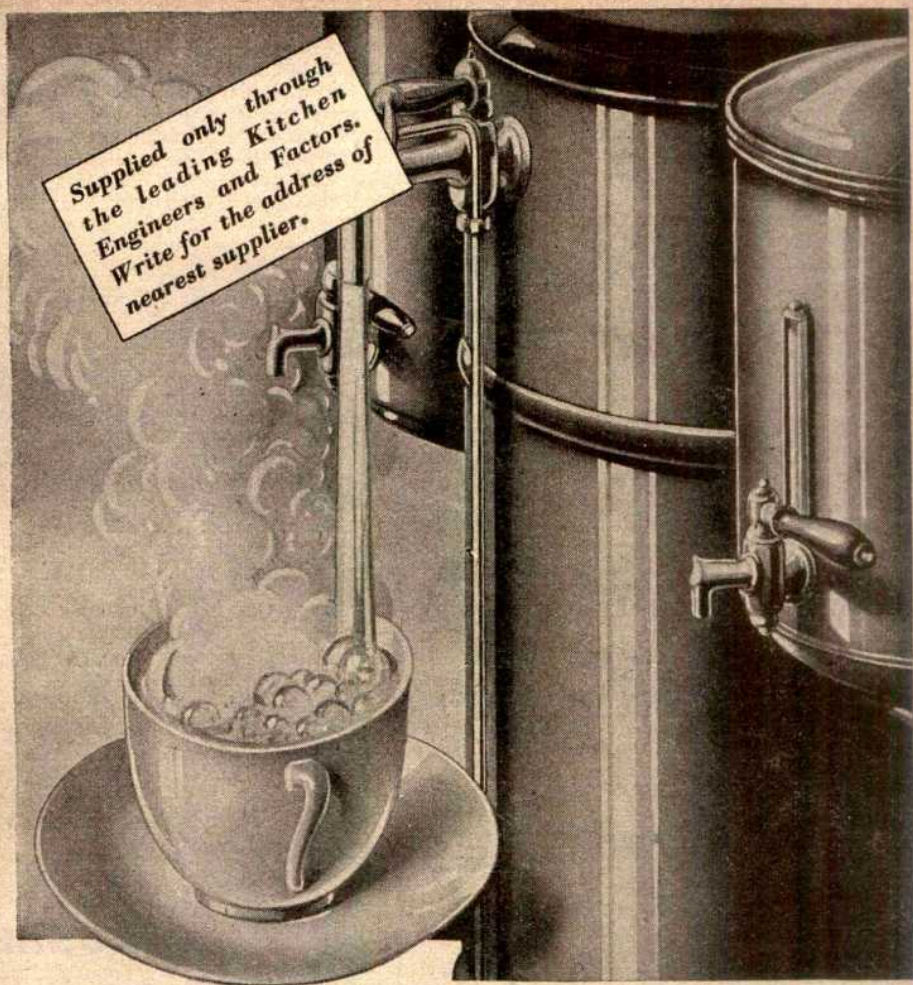
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room side, instead of considering the work involved to be the other side of the line of demarcation between kitchen and dining-room.

The cooking of the food alone is insufficient. It should be presented and eaten in pleasant surroundings, and when this obtains, the complaints received will be reduced. It is up to every canteen manager and managers to take a keen personal interest in their work, and prevail upon the factory management to assist them in an endeavour to attain conditions conducive to the preparation and partaking of meals in comfortable surroundings.

The Service. I do not propose to dwell upon the preparation and cooking of the meals, or with the menus and food served, but rather with the actual service in a restaurant, as opposed to that in a canteen.

Take the restaurant service first. One expects ease, comfort, and rest, but in achieving this, a main essential is being waited upon. Whilst this service has not been maintained universally, to the fullest degree during the trying wartime years, it is a service demanded in normal times. One chooses the dish which appeals and it is brought, to be followed by a choice of other foods and beverages. The meal is normally more pleasing to the eye, and has a more "individual touch" than a meal presented in a canteen. Why the difference? Let us investigate the reason.

A canteen has to cater for a large number at a definite time, while a restaurant has a steady flow, and when full, the customers have either to wait or go elsewhere. In a works, the em-

ployees have probably no alternative but to use the canteen, and they all require a meal at one and the same time.

Therefore, the canteen has to be sufficiently large and also adequately staffed to deal with a rush for a short period, after which the canteen is magically emptied. As a result, it is essential that large quantities of food should be prepared and then served in a few minutes.

In nine cases out of ten, the meals are all portioned and plated in advance and placed in a hot cupboard in readiness for the rush. There can be no question of "individuality", as time is so short.

The Problems of Service

Dependent upon the numbers for whom the meals are prepared, is the time lapse between the plating and placing in the hot closet of the first and last dinner. Only too often, the first meal plated has been "stored" far too long, whilst the contents of the last plate are cold by the time they are laid on the plate. Although, theoretically, this should not be, in actual practice it is usually the case.

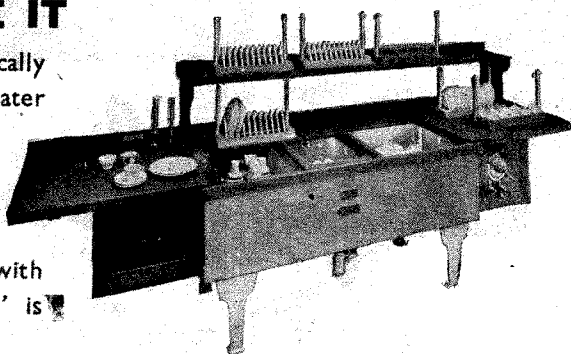
Now comes the most vital issue. Is it not possible to stagger the meal times? In many instances, it is most apparent that this could not be done, but surely there are numerous cases where departments could have meals at varying times. If this were done, there is no reason why a service more resembling that of a restaurant should not be given.

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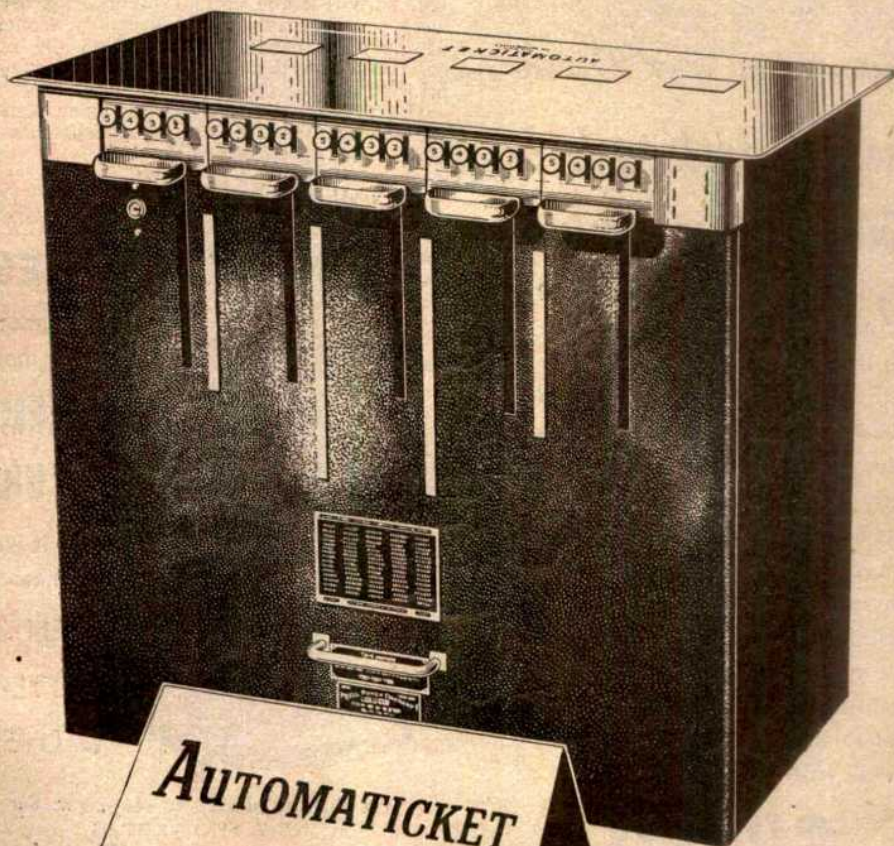
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still more, there would be an influx more like that of a restaurant. In this event, cooking could be spread over a longer period, the vegetables and other items being cooked and served in batches, so that they would be in a fresh state when presented.

Further, the crush and scramble at the barriers or hatchways would be eliminated to a large degree, and the dining accommodation would allow for smaller tables to be used, on account of the lesser numbers to be seated at one time. Alternatively, the spare space could accommodate some comfortable chairs for relaxation.

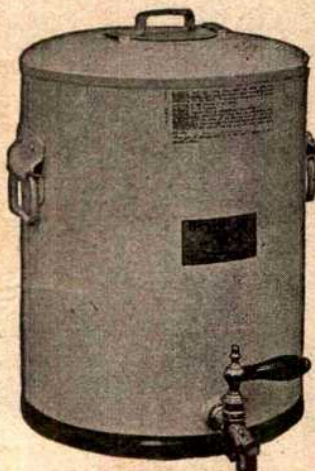
From this, it would be but a small step to arrange a waitress service. Although on the face of it, such suggestion might appear impossible, very little organisation of the canteen staff would be necessary in these circumstances, to carry the idea into effect.

It would be interesting to hear from any firms who have progressed so far. Their experience would undoubtedly be most helpful to those who want to improve conditions, and I feel sure that the editor would be pleased to have an opportunity of directing a member of his staff to inspect and record the results of such a service, with a view to publishing the information for the benefit of others.*

Has the case for retaining the name "canteen" for the majority of such establishments been established?

* It would be a pleasure.—Editor.

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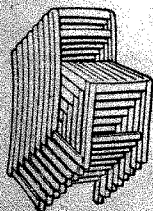
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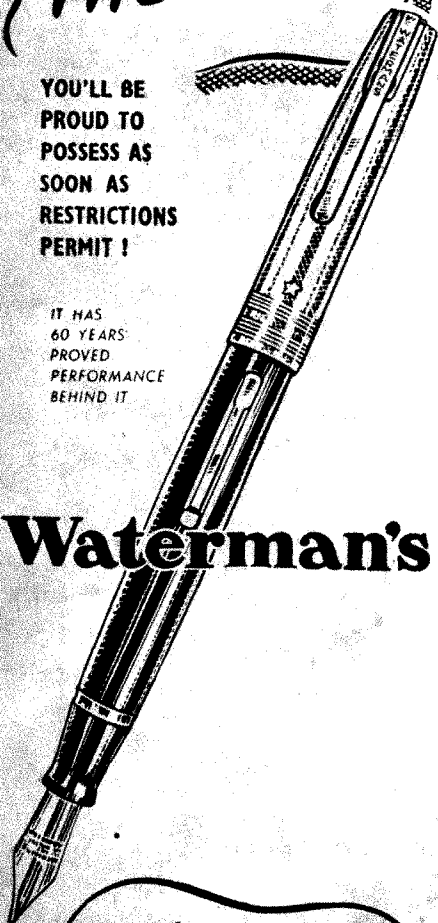
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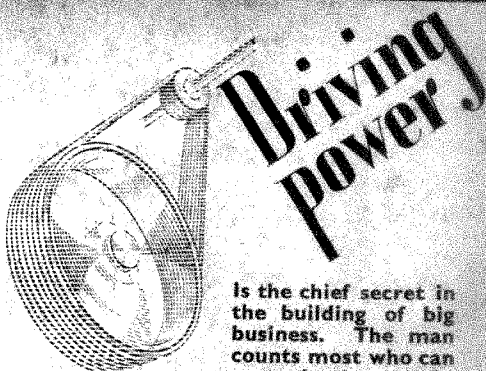


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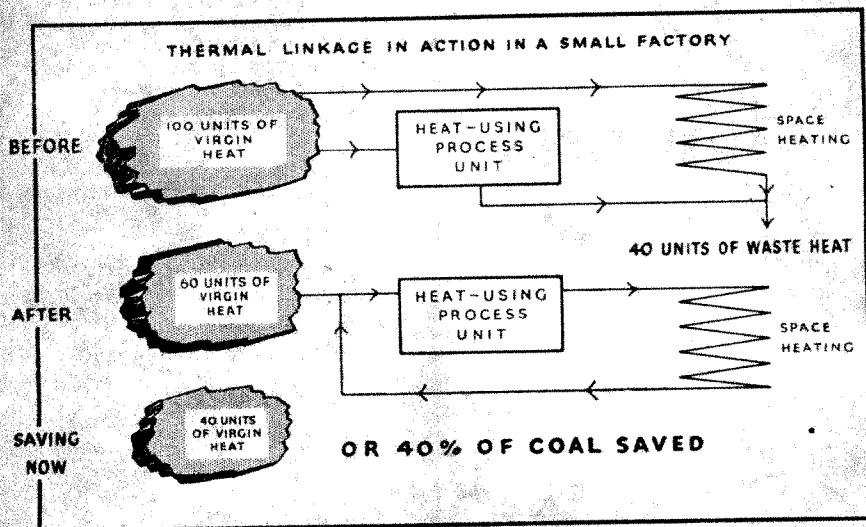
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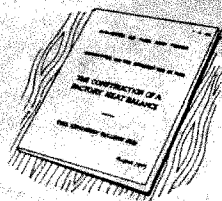


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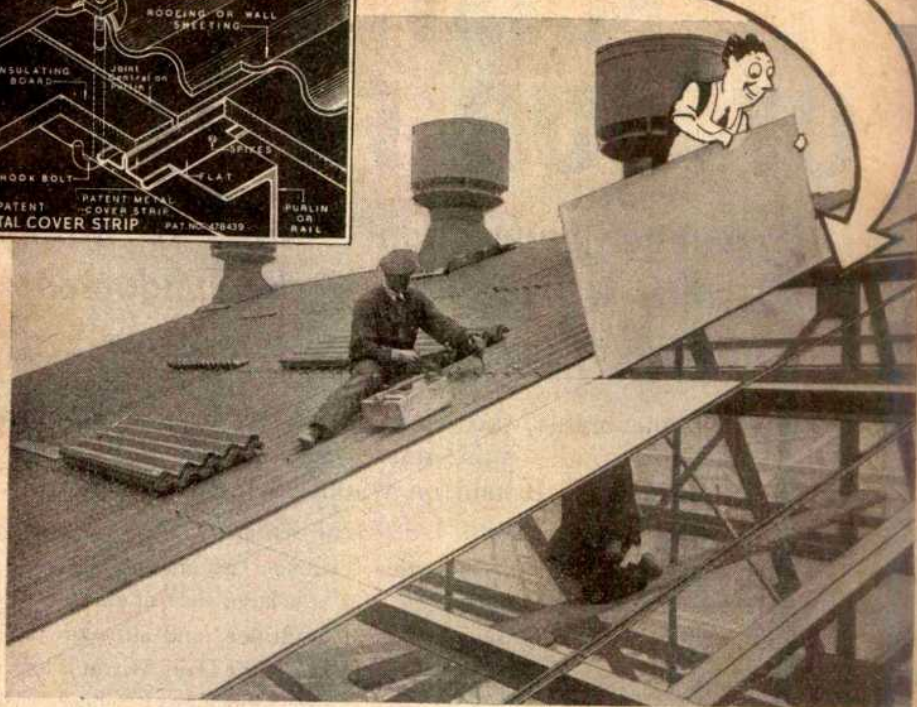
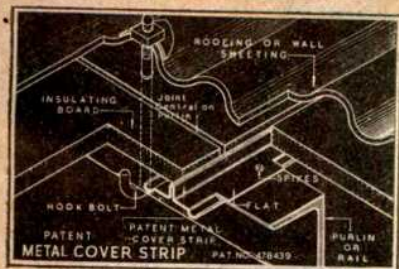
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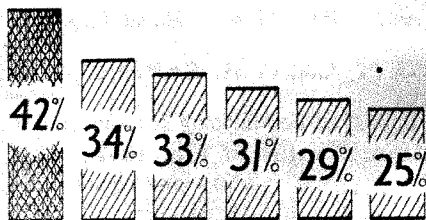
For a very long time past, one of the chief aims of the editorial policy of the Daily Mirror has been to reflect accurately and with sympathy the general viewpoint of youth. That is why the Daily Mirror is read by a greater proportion of the under 35's than any other national paper. Indeed, so successful has this policy been, that of the Daily Mirror's

2,400,000 readers, actually 42% are among this "younger generation."

This is a large slice of the future capital wealth of Britain, and although the advertising space in the Daily Mirror is temporarily over-booked, businesses whose well-being resides largely on the goodwill of the buyers of this country, cannot do better than plan to address their sales-messages direct to this "younger generation"—in the columns of their own newspaper, the Daily Mirror.

PROPORTION OF DAILY MIRROR READERS UNDER 35 COMPARED WITH OTHER NEWSPAPERS

DAILY MIRROR



DAILY MIRROR

Net sale in excess of 2,400,000 — second largest in the world

"OUR NEW WAREHOUSE . . . ALL
THE STORAGE BINS, LOCKERS
AND FITTINGS ARE STEEL BY
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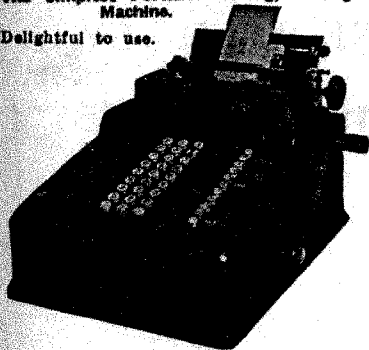
Adding Machines, Duplicators, Cash Registers, Calculators, Time Recorders,
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No modern Office can afford to be
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FOR POCKET OR DESK.
So Simple Anyone can use it.

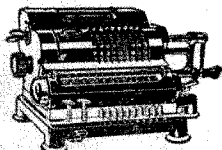


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Adds to 29,999 19s. 11½d. Price 25 6s.
When ordering state for what purpose
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For all calculations. Multiply, divide,
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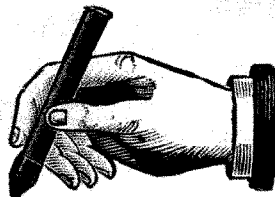
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and help the
War Effort

THE ALL-RUBBER DAMPER
gives squeeze control of moisture.

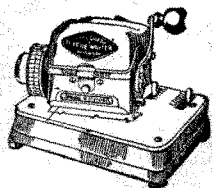


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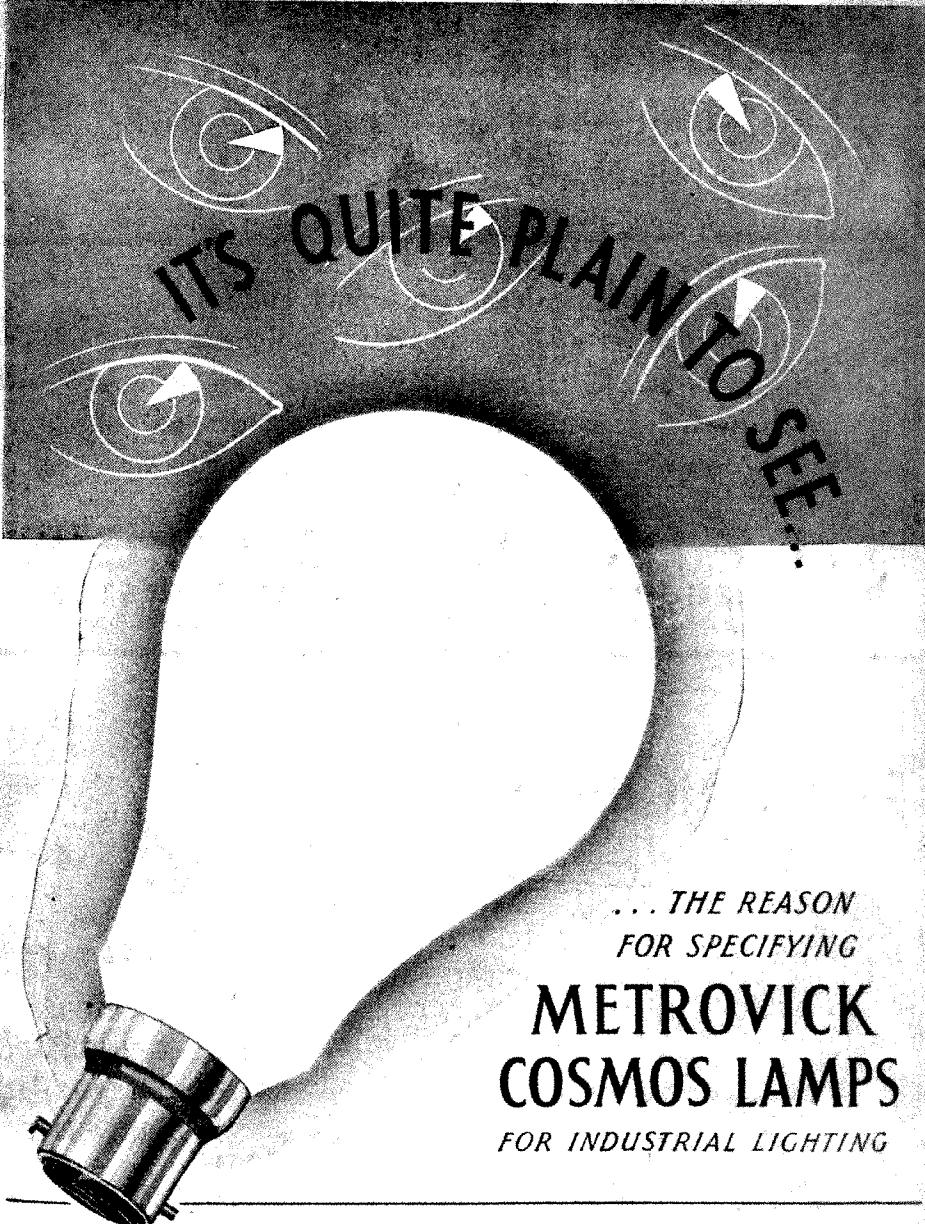
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bargain prices.

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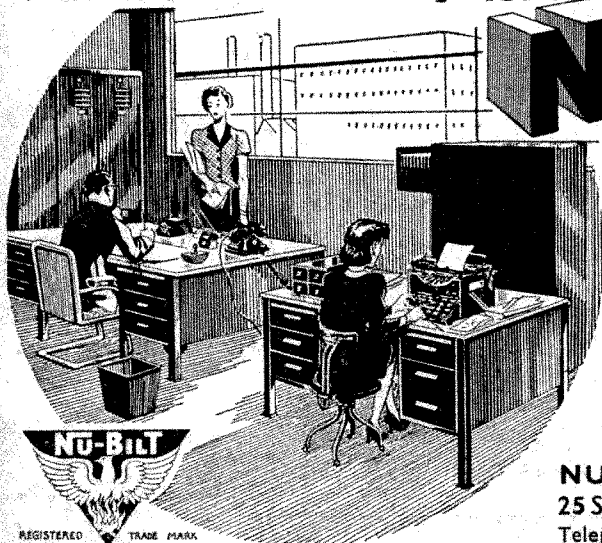
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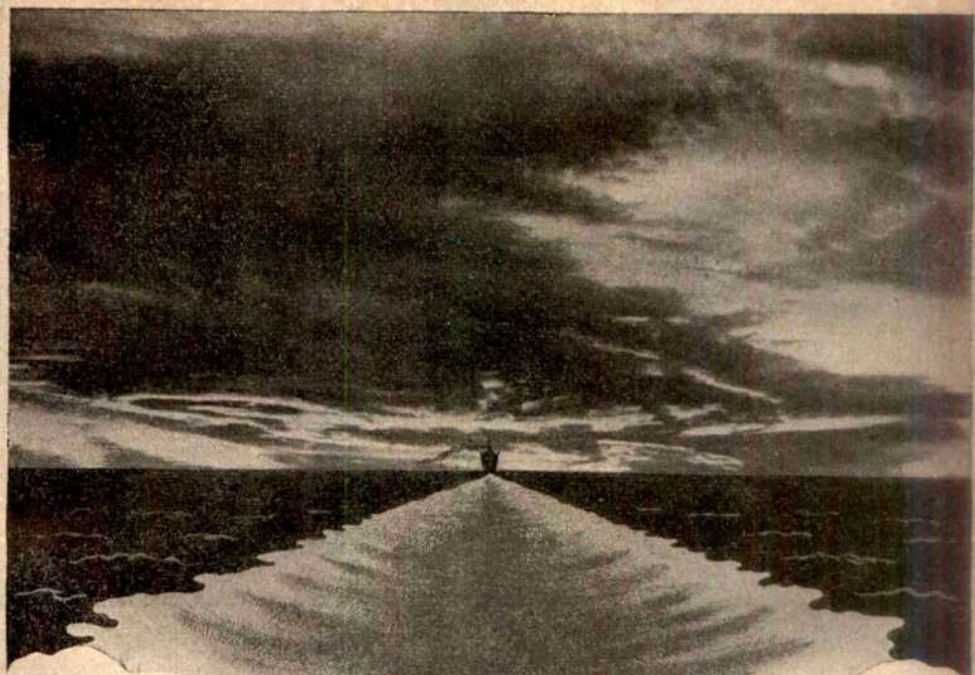


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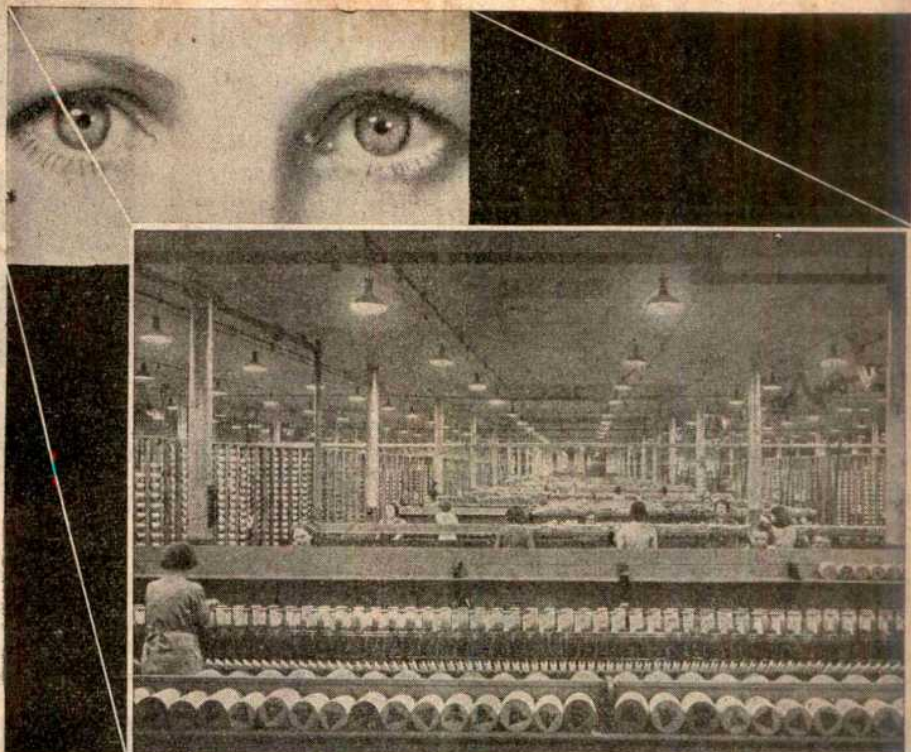
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BIRMINGHAM

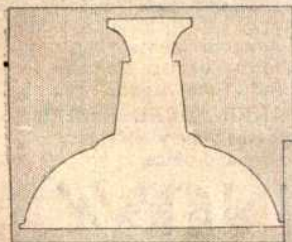
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No matter how complicated the structure may be, you can erect it by the KEE-KLAMP SYSTEM, which is Rigid yet Adaptable, Fixed yet Mobile, Simple yet Complex and Capable of Infinite Variation.

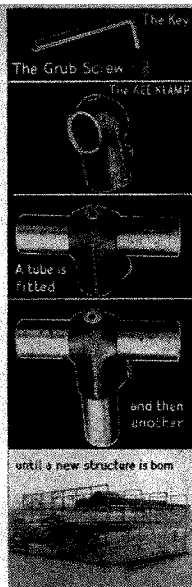
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The hardened steel Locking Screws, when screwed through the Kee-Klamp, grip the tube, giving rigid construction. Structures can be dismantled swiftly and re-erected elsewhere.

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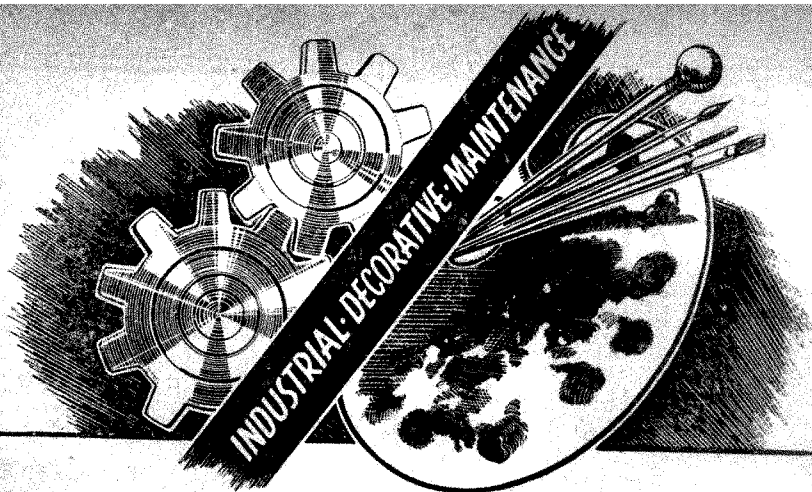
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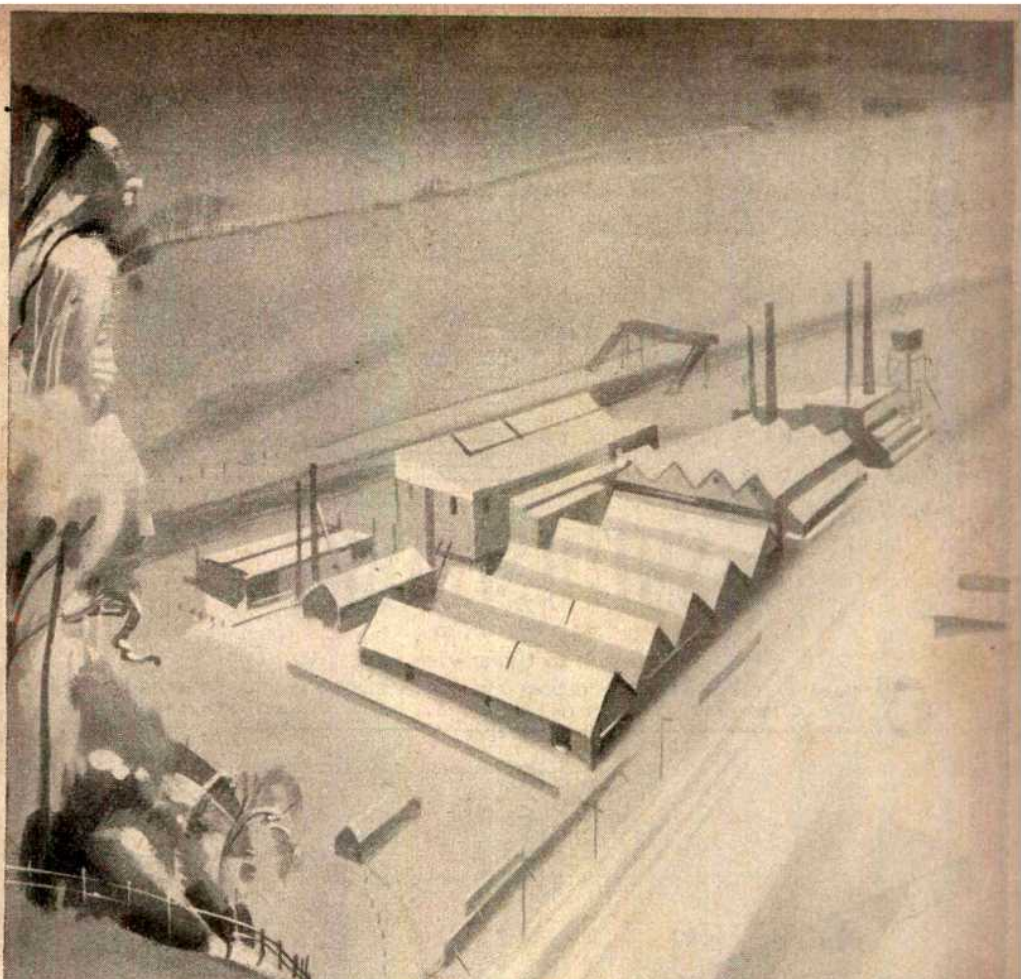
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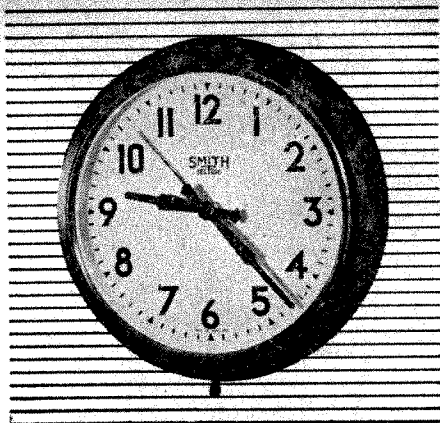
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The "Delhi" plugs in to Greenwich time and needs no winding or regulating.



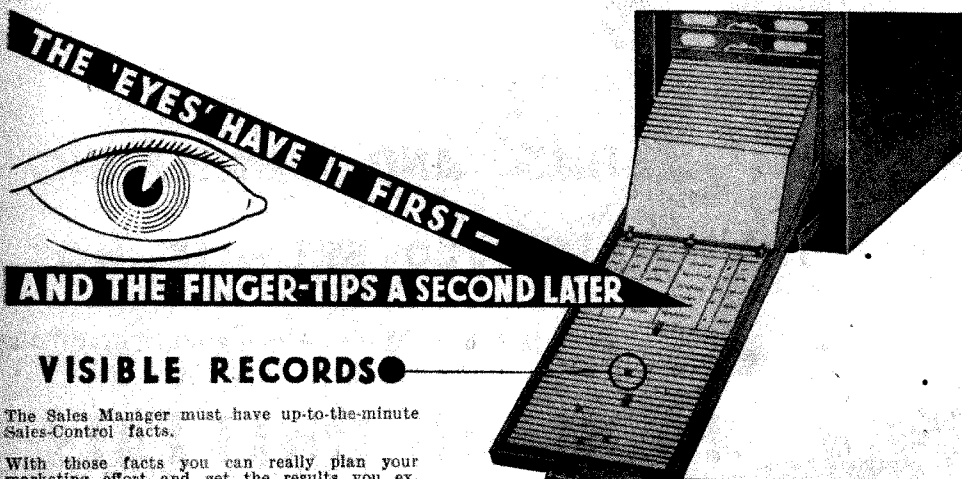
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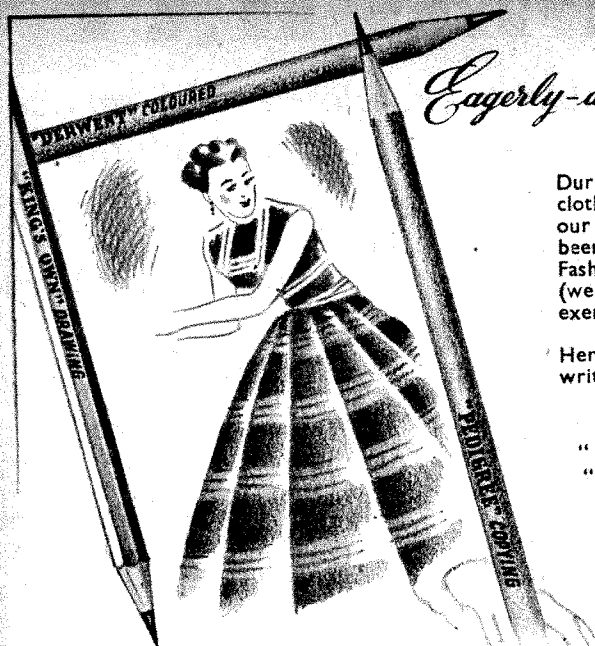
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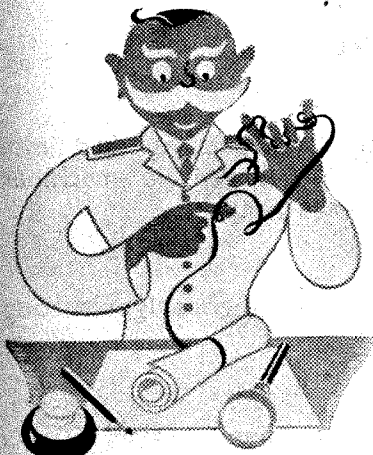
During the years of Utility clothing—of "making do" with our existing wardrobes, it has been difficult to realise that Fashions will return—that soon (we hope) we shall be able to exercise our own choice in clothes—and PENCILS, Here's then to the day when writing Fashions will be restored in

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and the many specialised Pencils of the Cumberland Range.

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SALES AND ENQUIRIES: BRITISH PENS LTD. BEARWOOD RD. BIRMINGHAM



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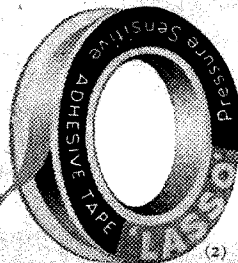
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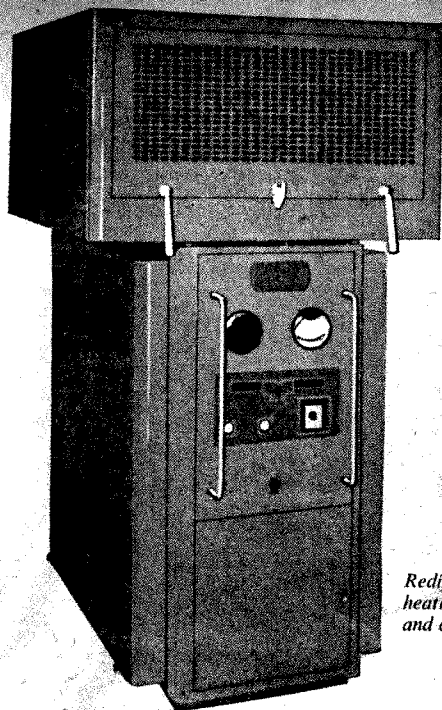
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PRESSURE SENSITIVE ADHESIVE TAPES

Herts Pharmaceuticals Ltd., Welwyn Garden City, Herts.



(2)



Redifon Model R.H.7, complete with heating chamber for plastics, rubber and other industries.

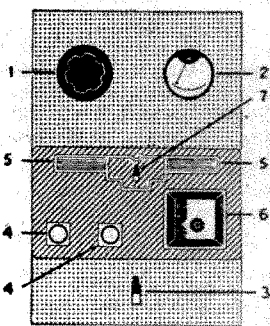
Radio Heaters available now for Increased Industrial Production

CUTS in production time can be achieved in a very large range of industries by the use of radio heating. And Rediffusion Ltd. are in a position to supply Redifon radio heaters now, particularly within the British Empire.

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All Redifon radio heaters are absolutely safe for use by unskilled operatives. The advice of Redifon Industrial Electronics Division is always available to manufacturers who require advice on the best use of radio heating.



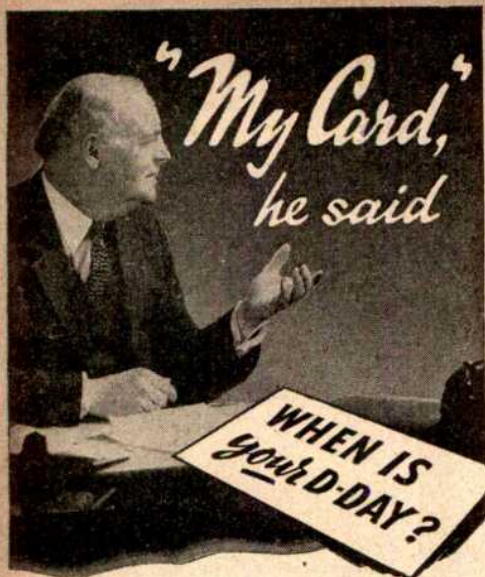
Redifon Model R.H.7 controls are compact and simple. (1) Power control (2) Output meter (3) Mains switch (4) Control press-buttons (5) Warning lights (6) Timing control (7) "Manual" or "Automatic" control.

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*Designers and Manufacturers of Radio Communication
and Industrial Electronic Equipment*

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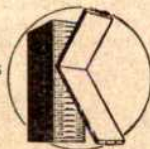
That fellow startled me, I'll tell you. When he first got busy on 'frustrated sales energy, dissipated sales energy, sales trends, population incomes and levels, population shifts, climatic requirements, and the like' — well, I thought it was all high-sounding stuff and a lot of 'hoey'.

That fellow knew his job all right. He touched me on the raw, but he got me in the end because I knew quite well that he was right.

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PRODUCTION · SALES



STOCK CONTROL

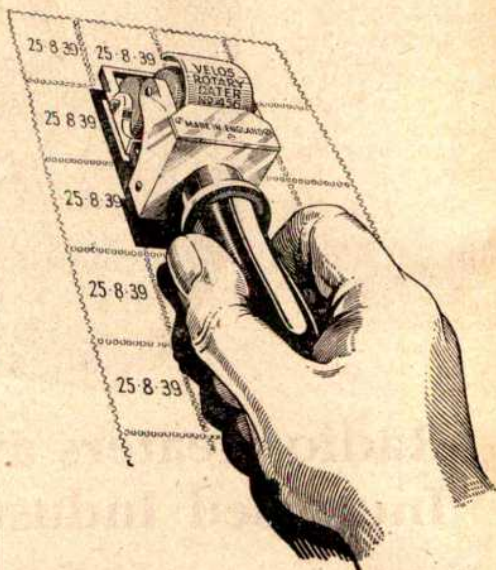
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ELIMINATES THE TEDIOUS JOB OF CANCELLING
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For large areas of floors, i.e. factories, workshops, canteens, schools, hospitals, the Dixon is the only machine of its kind on the market with all these advantages:—Wet scrubs large areas of floors 7 times faster than old-fashioned methods; can be used by any available labour; suitable for all types of floors; power-driven and perfectly balanced—does not tire the operator; can also be used for dry scrubbing or converted into a floor polisher.

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There is also the Dixon Power Suction Squeegee. It sucks up the dirty water and leaves the floor clean and dry.

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For hospitals, offices, public buildings, showrooms, etc., the Columbus dual purpose machine is recommended not only for its economy of labour but of expense too.

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*Floor Maintenance Equipment
Solves them!*

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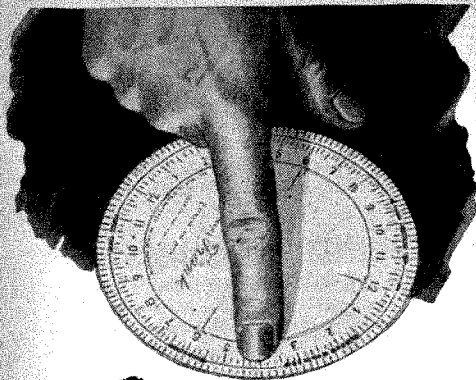
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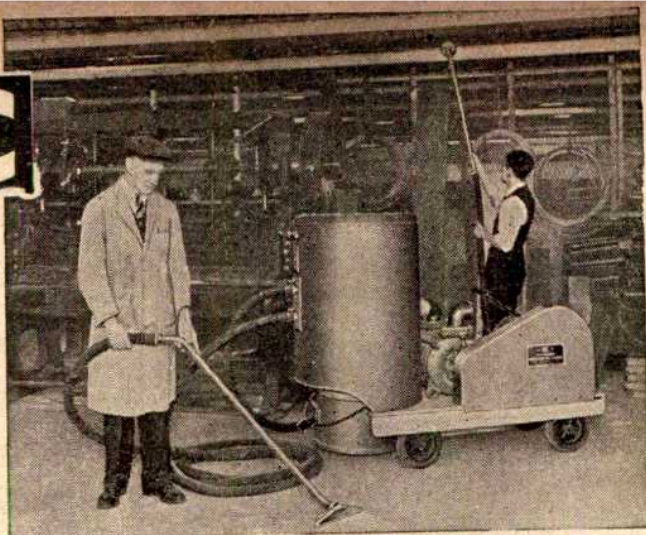
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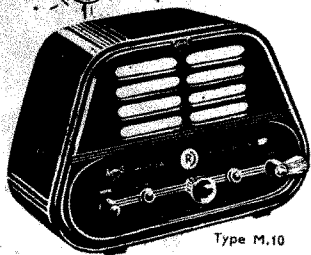
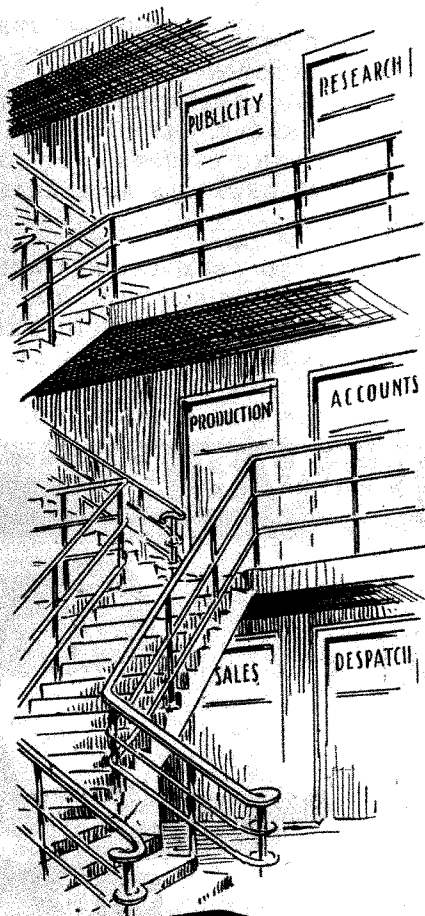
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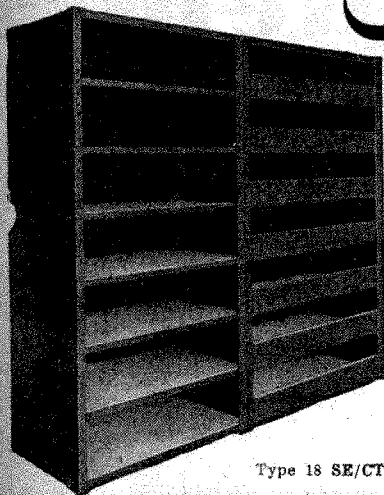
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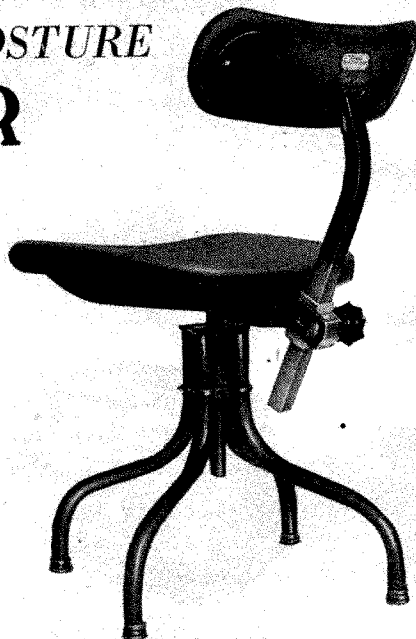
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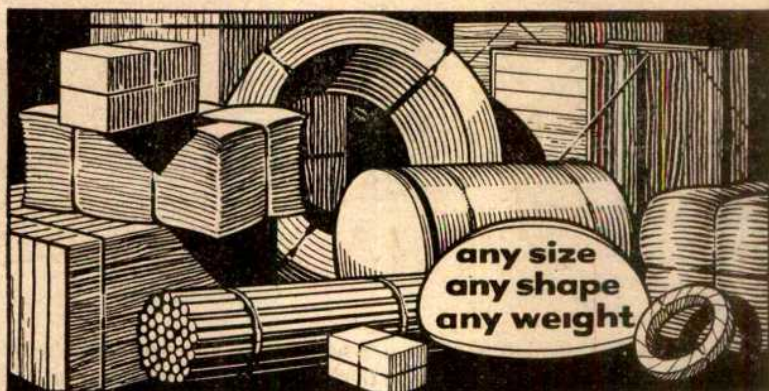
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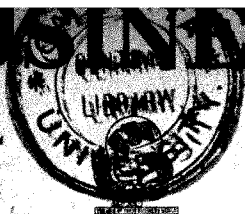
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P M.H., Reconversion and Efficiency are heavily accented in this issue. And a new aspect is examined. Output must expand, but economically. Here is the technique—the foolproof check-up—in the leading article.

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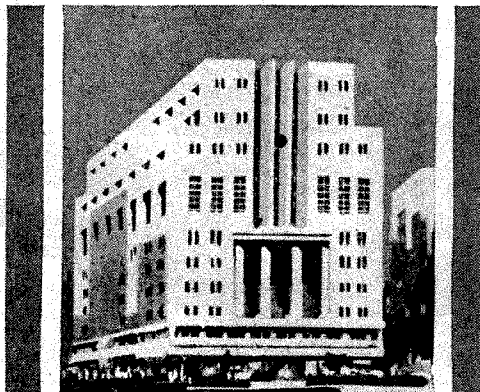
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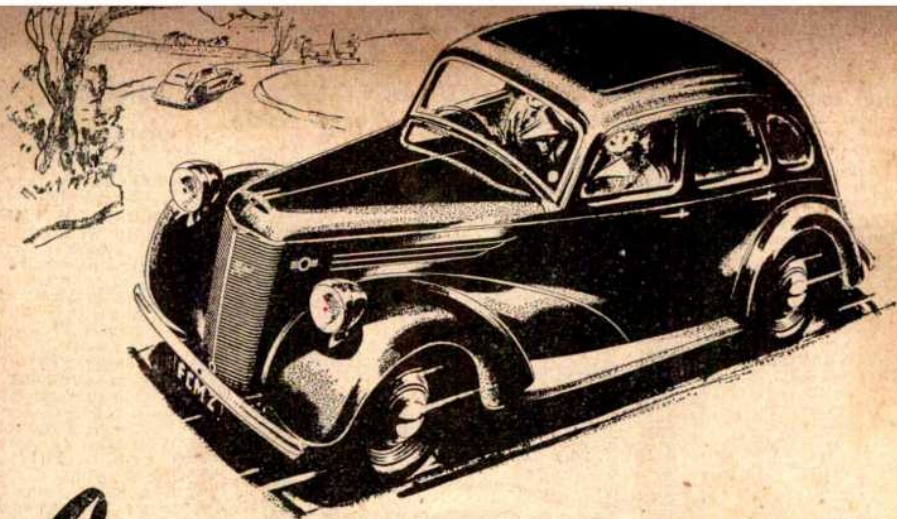
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EFFICIENCY AUDIT

The drive for greater production is on, but higher output can only be achieved by improving your present methods and equipment. Do you know the present condition in your own plant?

By BRIAN CUMMINGS

WHILE export trade is improving, production of raw materials and certain classes of consumer goods has been lagging. The Government campaign for increased production for export, the home market, and the re-equipment of industry, therefore, came none too soon.

The campaign, and the manpower debate with which it coincided, showed that both Government and Opposition are aware of the need for a sense of urgency in dealing with production problems. The Government plea for a revival of the "Dunkirk spirit" is but a repetition, in different words, of a call sounded in *BUSINESS* ever since the opening of 1946.

Nevertheless an appeal for increased production cannot, of itself, do much good. Psychologically, it is asking too much of management and men that they should repeat the great drive of 1940 in 1946 unless they are given not only firm guidance but incentives and encouragement.

The Commons debate, the succeeding con-

ferences between Government and management and Government and trades unions, and the discussions which have arisen from these events, have underlined the need for: (1) A wages policy which is related to production priorities and the need for encouraging men and women to work overtime. (2) Production targets and agreed P.M.H. criteria in the principal industries.

These and other ideas have already been discussed in *BUSINESS*. Now, however, a new (or comparatively new) one comes to light. A short while ago Mr. N. Baliol Scott, an expert in management who has had experience in both business and the Civil Service, pointed out that in discussing the need for greater efficiency in the conduct of the nation's affairs, we had to consider three separate fields: (1) The Government itself (Westminster and Whitehall). (2) Nationalized undertakings (since we are told that these will not be run by Civil servants). (3) Private enterprise.

Concerning himself with (2) only, Mr.

Baliol Scott suggested the setting up of a public efficiency committee of Parliament served by a permanent official and staff under some such title as "efficiency auditor," who would make periodic expert reports on the efficiency of the administration, management, and operation of each nationalized industry. This arrangement would correspond to the Public Accounts Committee and the Controller and Auditor-General.

We of BUSINESS are concerned with the idea of an efficiency audit, not only as an aid to greater production in nationalized undertakings, but as applied to private enterprises of various sizes. In the pages which follow the audit is examined from various points of view. But first let Mr. Scott explain his idea, and its application to the nationalized undertaking.

The nationalization policy of the Labour Government, Mr. Baliol Scott points out, gives to Parliament new functions and new responsibilities. Suitable methods will have to be devised by Parliament for the discharge of these functions and responsibilities. At the moment there is a danger that Parliament may either try to effect too close a control over nationalized undertakings or, alternatively, it may effect no control at all. In either event the results would be disastrous.

In public administration precedent counts a great deal, and there is no precedent in this case. Yet the earliest arrangements in nationalization will be taken as precedents. If in the first industries that are nationalized, Parliamentary control is considered suitably discharged by a financial audit, the precedent will be perpetuated. Yet, in Mr. Baliol Scott's view, the financial audit is inadequate to ensure proper operational efficiency.

In the first place, it is only made long after the event; in the second place, the financial audit as understood in public administration checks whether money has been legally spent, but not whether it has been wisely spent, nor whether the original objective of the expenditure has been properly achieved.

The conception of an efficiency audit is not in itself new—that is admitted. It is merely the application in the field of nationalization of a technique that has become recognised in business (under the title of "management audit") for some years.

Here I asked Mr. Baliol Scott how he would define efficiency, from the point of view of the audit. He gave a three-fold definition, applicable to the production side only, as follows: (1) Determination of the right article to be made. This involves consumer research and industrial design. The article must be functional to the job it has to per-

form. (2) Determination of the best way of making it. This includes design for production, especially quantity production, mechanisation, and speedy operation. (3) Achieving the quickest making of it. This refers to management in action involving production planning and control; avoidance of idleness of men, machines or materials; maintenance of good industrial relations; maintenance of plant and equipment, etc.

The efficiency auditor would have to assure himself that (1) and (2) were properly catered for. He would also be concerned with (3), assuring himself that a suitable technique of production control had been adopted, together with proper methods of cost keeping, stores keeping, etc. In these connections the recommendations of the British Standards Institute would be of use, though they would have to be modified to meet the individual case.

Risk of Interference

The efficiency auditor would see that the organisation structure of the nationalized concern was sound; that it provided for the various functions and sub-functions being in proper relation to each other and in their right relative emphasis; that there was a suitable personnel policy for the whole concern; that the line authority for actually getting the job done was not weakened by various special authorities. He would make sure that there was somebody in the organisation capable of preparing a profit graph.

Asked about the structure of the public efficiency committee, Mr. Baliol Scott said that it might develop from the concept of the work of the Committee on National Expenditure, the need for which was found to exist in both the Great War and the last war, when the Government had large scale activities under its control. But unlike the Public Accounts Committee, the Committee on National Expenditure had no permanent staff responsible to itself to gather and sift the necessary material. A public efficiency committee would thus need an efficiency auditor and staff.

"What powers would the efficiency committee possess? How would it avoid hindering by interference?" I asked. The powers of the committee would be analogous to those of the Public Accounts Committee, Mr. Baliol Scott replied. As to the question of interference, perhaps "audit" was not a very happy word—at any rate assuming that it means some kind of *post facto* check. But just as there is a pre-audit, so would the efficiency auditor see in advance that in general the right things were being done.

So much for the audit as applied to a

nationalized undertaking. Now let us see how it is applied to the free enterprise. For this technique I turned to Mr. J. Sandford Smith, who, like Mr. Baliol Scott, has experience in business and the Civil service.

Straightaway Mr. Smith answered a question which, if I am not mistaken, is already prominent in our readers' minds, *viz.* "Why can outsiders judge the wisdom of any policy better than those concerned day by day with the management of the business?"

"The practical application of an efficiency audit," he said, "shows time after time that the outsider can make a valuable contribution towards achieving the most effective policy. The fresh mind, freed from the harness of daily routine, sees the problem in a new scale of values.

"Again, the very fact that he has to formulate and vindicate his policies to an efficiency auditor constrains an executive to review and assess policy in the privacy of his own mind. Policy has to be made explicit. Its value can be measured against measured facilities, markets and results. Seldom does such contemplation fail to yield a result.

"It is a paradox of administration that it calls for what might be described as stable change, *i.e.*, both continuity of direction and freshness of conception. A new method or system takes time to develop into a smooth routine. Constant changes of methods are wasteful and inefficient, but methods must always be adapted to altered circumstances.

"A quinquennial inspection by efficiency auditors provides the stimulus to re-examine methods and systems with reasonable frequency to ensure adaptation to existing circumstances and yet not too often to cause confusion and disturbance.

"There are three main difficulties which the administrator has to face when introducing an improved system or method into the works for which he is responsible. Firstly, being in close daily touch it is difficult for him to get a fair view of this one section in the perspective of the whole business. Secondly, the implementation of new schemes demands close personal attention, and it is seldom that the busy administrator can find time to devote his whole attention to the initiation of a new routine. Thirdly, he will probably not have a broad enough experience of other methods in different businesses to be certain that he can select the one most suitable for his own.

"For the commercial concern the efficiency auditor would examine the trading account and the balance sheet. The latter is the finished picture of the financial audit and the eventual background from which a study of the management machine can be initiated.

"A study would be made of the trading account and balance sheets for the past four or five years to get the trend position. An examination of the last balance sheet would be made to determine whether it showed a healthy position, that the working capital was adequate, that assets were reasonably valued.

"The rate of earnings to capital, including reserves and loans, would be ascertained. On the trading account the auditor would examine the ratio of stock to turnover, of work-in-progress to turnover, of profit to turnover, to satisfy himself that proper material control is maintained, that the programme of production is good, and that the marketing effectiveness of the company is at a reasonable level.

"He would enquire whether there was a pre-determined budget against which expenses are controlled. The auditor would then review the marketing policy. Are the products showing a consistent policy towards a defined market? What is the size and distribution of the potential market, and what share of it is being achieved? Is the ultimate consumer being reached in the most effective and economical way?"

The Span of Control

Enquiries on this level, said Mr. Smith, would cover all aspects of marketing and selling. Next the auditor would ask for the organisational chart. How does the authority flow? Are the instructions on the routines clearly laid down in writing? What is the span of control? Is there duplication of effort?

He would seek to determine a measure of production efficiency. Is the production keyed to the budgetary control system and effectively linked with estimates of sales? Does the business enjoy the benefit of standard costs, and if so are the standards set correctly and are the variations examined fully and the faults thus revealed, corrected?

Again, personnel control would be examined. The auditor would find out the opinions of labour. He would seek out the labour turnover, review labour training schemes, and generally satisfy himself that the labour management was on a sound and progressive basis.

As to the audit staff, it would be divided into two categories—the audit principal and the audit assistant. It would be the duty of the assistant to verify that what was reported by the executives as being in practice was in fact being carried out. It is one of the particular difficulties of large scale organisation that the higher executives cannot know definitely what is happening at all times in their departments, and unwittingly they may mis-

lead the auditor unless the latter is checking the routines from the lowest level upwards.

"There are today undoubtedly too few men competent to carry out duties of audit principal," Mr. Smith concluded. "A wide technical knowledge is essential but coupled with this there must be practical experience of administering large scale enterprises. Too often the successful administrator is not prepared to give up his appointment, where he has achieved success and has a safe position for life, in exchange for making a new beginning as a professional efficiency auditor.

"Yet it is an urgent national need that these men who have shown success in administration should broaden their technique by seeing the inner working of other concerns and passing, from enterprise to enterprise the accumulated technique which they are constantly acquiring. There can be no doubt of the value to nationalized industry of an efficiency audit. It is equally certain that the staffing of that audit will represent a major problem."

Now let us see what one of the greatest and most experienced consultants on this or the other side of the Atlantic has to say about the possibility of making an efficiency audit.

"How can we make an efficiency audit?" I put the question to him just like that, "The

only way, if you are to steer clear of trouble is to keep the problem of production (for it is production's efficiency that you are auditing) from workers' affairs, management, policy, etc. You are looking into production. You are looking to see how well the worker works, how he uses the tools he has, and so forth.

"What applies in one business does not necessarily apply in another. There is no universal business policy. You cannot standardise rules for running any two businesses, for in each case they would probably be as unlike each other as the rules for rugby and soccer.

"It is popularly and unfortunately thought that when an American business man sees things go wrong, he immediately calls in a consultant. The wisest of them do, but a consultant with a difference. Too many so-called consultants sell either a method or a system. If the manufacturer is sold on the idea, he begins to operate the method or install the system. Watch what happens.

"Every system installed leads finally to the rejection of the older system; demands in varying degrees the re-training of executive staff as well as operators; calls for a change of mind and a necessary co-operation between those responsible for introducing the new

Please turn to page 86.

How You Can Adapt and Apply An Efficiency Audit in a Small Or Medium Concern

Documentation By JOHN W. HENDRY, F.R. Econ.S., F.I.F.M.

SEEING is believing. So far the policies and the specific profitability of the Efficiency Audit have been discussed in detail, but you want to see how it works, you want too to know how to set about putting the Efficiency Audit to work, who participates in the programme, what executives are affected, what extra work is entailed.

The easiest way to show these things and to answer these questions is to produce documentary evidence. To tell the story in documents is to clarify the argument. We have therefore asked Mr. John W. Hendry to furnish us with the detailed record of an Efficiency Audit that has definitely been used with profitable results in small and medium undertakings.

Clearer than any words it shows that a decision has been reached by the Board and step by step the whole Audit is built up. Naturally enough the figures are fictitious, as you would expect. But in fact one such Audit as this we now document, did reveal a deficiency of some 40,000 units below the schedule. Had it not been for the Audit the nearest figure to the deficiency would have been a good guess, but with unerring accuracy the Audit revealed it in the minutest detail. What is more the causes for the deficiency became apparent as each executive analysed, reported and recommended.

In a way the Efficiency Audit might be described as a major operation in management surgery.

MEMO TO: WORKS MANAGER COPIES TO COSTS, M.P.O. 14/11/45
FROM: THE BOARD.

The board at a meeting today have decided to initiate an "efficiency audit" with a view to measuring:-

- (a) The progression of our reconversion programme.
- (b) Profit leaks through hidden inefficiencies.
- (c) Economies that might permit us to compete more favourably.
- (d) M.H.P. in relation to estimates and budgets.

Details to be left to you but a report is required inside 3 weeks.

John Kildare. (Secretary)

The decision has been made. An efficiency audit is wanted. With the first document, a memo from the Managing Director, the ball begins to roll

MEMO TO: WORKS SUPERVISOR 17/11/45
FROM: WORKS MANAGER

At the Board's direction, I am instituting an efficiency audit which will cover the following facets:-

- (a) Purchase & Progress. (including costs)
- (b) Material supply. (details of shorts)
- (c) Direct Production (ratio of budget to actual)
- (d) Machine utilisation (base this on 1,2 & 3 shift working)
- (e) % Indirects to productives.
- (f) Overcosts, i.e. Floor space, Machine tool wear, Fuel, Welfare, Personnel & Research.

I shall issue individual directives to supervision, I require reports within ten days of their receipt. I cannot accept excuses. This is important.

M. Peller Works Manager.

Now the works manager assesses the import of the top directive. The tentacles begin to spread: every executive gets his orders. To fulfil them he must be on his toes. He has been set a 10-day dead-line

TO: WORKS MANAGER
FROM: PURCHASING DEPT.

(A)

FOR ORDER 3279 REPORT Sheet 3 of 6 26/11/45

PART.	EST COST (£)	ACTUAL (£)	DELIVERY		COST UP % DOWN	PLANT	
			ESTIM.	ACTUAL		As ORD.	DLVD.
ALLOYS FOR CASTING	450	498	EVERY 10 DAYS	EVERY 10 DAYS	9.66	-	-
M/Steel (Rod)	1,600	1,500	3 MONTHS	6 WKS.	6.25	-	-
SHIELDS (BAKELITE)	785	785	-	6 WKS.	-	-	-
F.H.P. MOTORS	12,800	13,000	Weekly	Weekly	1.56	-	-
STUDS	125	125		Bulk	-	-	-
BASES	980	980	Weekly	Weekly	-	-	-
BRACKETS	230	250	-	Bulk	8.7		

The results begin to pour in. Information flows back to the works manager. First factual document is the report from the chief purchasing officer. A picture of the position in one department becomes clear

HANGERS	590	620	-	Bulk	11.85	-	-
A.V.C. SHORTS	720	780	Weekly	Weekly	8.5	-	-
TOTALS	86,424	74,623	-	-	12.6	-	-

TO: WORKS MANAGER
FROM: PROGRESS DEPT.

(B)

FOR ORDER 4931 REPORT Sheet 2 of 3 28/11/45

MAT	PART	ORD'D	DELY'D	SHORT	REASON	AFFECTS	PROGNOSIS
MAIZAC	BOWL	3 TONS	-	3 TONS	NO PRIORITY	DIE-CAST M/C SHOP ASSEMBLY	3 MONTHS DELAY
CONTACTS	CONTACTS	30,000	10,000	20,000	PROGRESS	OK	OK
BUSHES	GEAR BOX	10,000	-	10,000	Manufacturer's shortage	ASSY.	30 DAYS
C/HEAD SCREWS	A.V.C.	18,000	8,000	8,000	PROGRESS	OK	OK
NOTE CS/2 2 BA							

This next document brings new facts. Report No. 2 brings up the problems of progress. More daylight. The question can be partly answered "Is progress impeded by material shortages?"

More information for the works manager. Now it comes from the machine shop. Section by section the potential is analysed. The efficiency audit takes shape. Budget efficiency percentage is constant. Group efficiency figures reveal the variations

MACHINE SHOP ANALYSIS ©									
GROUP	JOB	HOURS TAKEN	UNIT HOURS PROD	EXTRA ALLOWANCES		DAY WORK	WTG. TIME	GROUP EFFCY.	BUDGET %
SMALL CAPSTANS	696	442	528	14	12	—	—	122%	140
LARGE CAPSTANS	696	446	560	—	6	—	28	125%	140
40 TONS	694	484	643	—	14	—	16	131%	140
90 TONS	698	421	614	—	—	—	—	145%	140
DRILLS	694	484	523	—	8	—	—	109%	140
TAPS	994	321	489	—	—	—	—	152%	140
FLY PRESSES	691	426	211	19	—	123	40	185%	140
GUILLOTINE	698	119	213	—	14	—	—	180%	140
FETTLE	691	129	229	—	—	—	—	144%	140
PLATE	992	424	968	—	23	—	—	131%	140
TOTALS		3721	4981	33	44	123	84	134%	140

The machine shop manager next tackles the production manager's analysis on the following formulae:

Cost hour = (labour) max. load at day rate plus actual load percentage efficiency (bonus) = X.

Cost hour = X

But for max. load more than one shift hourly rate increases due to awards for night work. M/c cost hour = inverse ratio of loading efficiency to M/c cost allocation

MACHINE CAPACITY													(D)
BASED ON 24 HRS. x 5 = 120 HRS. PER WEEK													
MACHINE GROUP	BASED ON 45 HR. WK.				BASED ON 2x40 HR. SHIFTS				BASED ON 3x40 HR. SHIFTS				
	MAX. LOAD	ACTUAL	COST/HR.		MAX. LOAD	EST. ACTUAL	COST/HR.		MAX. LOAD	EST. ACTUAL	COST/HR.		
			LABOUR	M/C			LABOUR	M/C			LABOUR	M/C	
CAPSTANS	39.3	30	2.34	6.0	68.33	60	3.03	3.0	102.5	90	3.03	2.0	
PRESSES	39.3	28	2.19	4.9	68.33	56	2.82	2.45	102.5	84	2.82	1.63	
DRILLS & TAPS	39.3	16	2.05	3.8	68.33	32	2.62	1.9	102.5	63	2.62	1.23	
GUILTINE	39.3	38	3.42	3.25	68.33	65	4.38	1.9	102.5	97.5	4.38	1.23	
DIE-CASTING	39.3	34	2.89	6.8	68.33	65	3.82	3.88	102.5	97.5	3.82	2.88	
FETTLING (POWER)	39.3	30	3.02	1.9	68.33	60	3.88	.95	102.5	90	3.88	.618	
PLATE	39.3	28	2.19	1.2	68.33	36	2.8	.6	102.5	84	2.8	.4	
MILLS	39.3	14	1.86	7.25	68.33	34	2.38	3.6	102.5	51	2.38	2.4	
GRINDING	39.3	22	1.94	6.83	68.33	44	2.48	3.44	102.5	66	2.48	2.24	
	A	B	C		A	B	C		A	B	C		

(E) "INDIRECT RATIO"	
DIRECT = 100	
PROGRESS	14%
PURCHASE	6%
BONUS CLERKS	2%
WAGES & P.A.Y.E.	16%
COSTING & ACCOUNTS	10%
INSPECTION	23%
SUPERVISION	9%
TRUCKING - MAINTENANCE AND PACKING	14%
ADMINISTRATIVE	8%

Memo to Works Manager from Plant Engineer: (G)	
Your floor space is divided amongst the various sections as follows:-	
M/o Shop	15,000
Sub/assy	12,000
Final/assy	16,000
Storage	6,000
Works Offices	12,000
Administrative	12,000
Canteen	3,000
First Aid	800
Yard & Drive	1,000

Combined operations are worked out by production and office managers. Productive and non-productive sides are now coming into focus

Even floor space areas are assessed in the efficiency audit. If it's used unwisely, it adds to the costs of the product

TO: WORKS MANAGER FROM: WORKS ACCOUNTANT ONCOSTS	
(F)	
(1) Floor space costs 2/6d. per foot per annum (2) You have 2 mills, 1 capstan & 3 presses which have not yielded their 10% plus 2% depreciative value. (3) Fuel last year cost an average of £1.0.3d. per head. (4) Welfare cost 3/6d. per head. (5) Research, this costs £3,000 in salaries & plant brought in - works out at 19/3d. per hour per 45 HR. week. (6) Personnel dept. cost £1,200 last year.	

The accountant adds still more facts. Machines, fuel, welfare, research and personnel have been costed on a unit basis

DISTRIBUTION OF LOST TIME & EXCESS ALLOWANCES (H)												
WEEK ENDING	Department's Responsibility											
	WAITING for WORK	WAITING for MATERIALS	WAITING for INSTRUC- TIONS	NON ASSIGN	MACHINE BREAK- DOWN	INDIRECT LOSS PLANT LABOUR	TOTAL	PROGRESS ALLOWANCE	OVERTIME	TOTAL	UNITS REQUIRED TO EQUAL SCHEDULE UNIT HR.	
REF. PERIOD	246	194	16	12	49	169 420	200	16%	153	369	16,000	
RE- CONVERSION	136	89	33	19	58	48 380	389	19%	204	472	14,720	
QUARTERLY TOTALS	796	632	196	79	280	769 1320	985	28%	485	1152	37,648	

Now the works manager knows where the firm stands. Watch that total figure 37,648 in the last right hand column. It reveals a deficiency that must be put right. Policy can be shaped to do it. Do you have these figures? If not, how do you measure your management efficiency?

FROM: Works Manager
TO: THE BOARD

DATE 14/12/45

Subject: Efficiency Audit

For your scrutiny, here is the "audit" together with some recommendations.

DETAIL	Ref	Comment	RECOMMENDATIONS	See
Purchase Dept.	A	Costs up £8,000 on programme (12.6%) - apparently due to demurrage at wharfs.	Suggest we increase our stores to accommodate bulk stock.	G
Progress Dept.	B	Held up due to shorts.	Investigate new AVENUES, follow on orders will absorb exist order.	-
M/c shop	C	P.M.H. is not up to expectations.	Personnel to start "drive" - Time Study to investigate - form workers' panel to break apathy.	-
Assembly Dept.	C	see above	see above	-
Chassis Dept.	C	" "	" "	-
M/c Capacity	D	Drills, mills & Grinding under capacity.	Cut back on all working times, accept outside orders to build up capacity, put on 2 shifts to reduce m/c costs.	F
INDIRECTS	E	Progress, wages, Inspection are high.	Merge wages & bonus & costs. Get T.S. to look at Inspection.	
ONCOSTS	F	M/c's not yielding depreciation return. Welfare is high Research m/c is high Fuel	Scrap 2 presses, mills & capstans to be remodelled. Transfer functions from paid staffs to voluntary sports club retain only supervisor. Transfer m/c to tool room to make available for capacity. Investigate Thermal insulation.	
Floor Space	G	Storage must be increased.	Cut back works offices & Sub/ Assy. Transfer FIRST AID to Admin. block - expect to gain 2,000 feet	A
Rejects	C	These are low - 2.15%	Reconcile output with this figure - do we need such dimensioning?	
D/ work & Waiting time	C	15.55% - could this be improved - see		F

By memorandum and report, the works manager has obtained a full and true picture of the state of production and the state of cost. He knows what every unit means in energy, in space and in cash. The audit has revealed a deficiency of more than 37,600 units. That figure is required to equal the scheduled unit hour.

Now he submits his report (illustrated above) comprehensive and detailed, to the board. Every department has been coded, the existing state of affairs commented upon, recommendations are made. By cross coding the references flash recommendations back to comment. This way the board can take positive action based on sifted, coded, documented evidence agreed to by every responsible executive.

TOYS

The Industry Grows Up

By ROBERT N. HUNTER

BITAIN'S toy manufacturing industry is no mere infant! Long since has it cut its eye teeth. By 1938-1939, production methods existed which challenged competition with those in similar factories in any country in the world. All the civilised world knew the "Made in Britain" stamp on toys on the nursery floors. Youngsters in places as far apart as Cyprus, Arabia, Falkland Islands, the Celebes, and Afghanistan hugged British dolls and played with British mechanical toys.

If the majority had to be reached in Britain's toy manufacturing industry, it was attained without doubt in the war just ended. Factory after factory, some in their entirety, others in part, were turned over to important war manufacture. One factory alone, and it is but typical, turned out one million machine guns, ten million magazines, twelve million land mines, rocket projectors, aerial bombs, rocket propelled gliders, drop tanks for fighter aircraft, gas mask parts, apparatus for dropping leaflets, light tubular equipment for airborne operations, gyro controlled gliders, secret infra-red ray invasion apparatus, sten guns, cannon shells, and many other items.

Twenty thousand workers were employed in the industry previous to the outbreak of war. Despite the serious inroads made in both the home market and world market by German and Japanese products, British toy manufacturers, according to informed comment, were riding on the crest of a wave. American-made toys of certain types were a factor to be reckoned with in the home market, in which competition also occurred from Sweden, Holland, France, Italy and Czecho-Slovakia.

For many years the toy industry in Britain was not taken seriously enough, whereas it was taken extremely seriously in Germany, both from the point of view as an industry and its economic relationship to other industries in utilisation of materials which otherwise would have been scrap waste. And in the toy areas of Germany children received certain elements of training in their last year in primary school.

Today Nuremberg and Leipzig, two great toy centres, lie to a considerable extent in

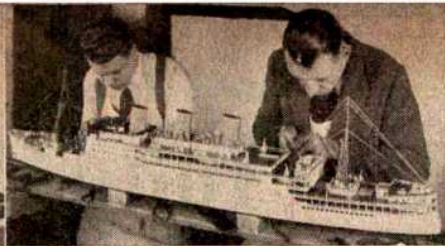
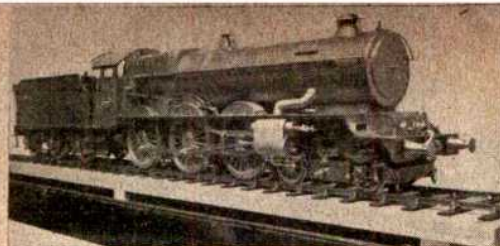


ruins and may never recover. The world-famed Leipzig Fair, at which as many as 7,000 firms used to exhibit, shall have passed into history, if the enterprise of British manufacturers shall make certain of the Fair's demise. Japan lies beaten with its industry seriously disorganised.

Another of Germany's toy areas is in the area under Russian control. It is unlikely that parents throughout Europe, the Dominions and the Colonies, for one generation at least, would be free of mental associations with barbarism and inhumanity on seeing a "Made in Germany" or "Made in Japan" trademark on a toy.

The potentialities facing British toy manufacturers are tremendous. First, there is the home market in which British manufacturers will have the opportunity to establish a near monopoly under the protection afforded by the effect of severe National financial stringency on possible imports. This market absorbed foreign toys to the value of £1,719,293 in the year 1938. No reason exists why the greater portion of this amount should not permanently be the preserve of British toy benches.

We foresee, also, a vastly increased home market as compared with pre-war, arising from a new factor, the extent of which is perhaps not yet fully appreciated by toy manufacturers—the greater buying power of the masses. Pre-war, the "poor," or those of the so-called working class of very limited means, had to be content in many cases with poor, second-hand, or discarded toys, and even damaged toys in some instances. With an increased standard of living wage they become potential buyers of good new toys, which they will naturally demand.



No job here for the semi-skilled: Model-making demands craftsmanship and accuracy, miniatures certainly, but not toys. They carry Britain's name and prestige all over the world

Then, there is the export market enjoyed pre-war. In the year 1938 Britain exported £452,349 of toys. Available to be captured is an extensive proportion of the world market in toys which was supplied pre-war by Germany and Japan.

Is Britain's toy industry being geared up as a whole to take advantage of the potentialities not only of the export market but also of the home market? Has the British Toy Manufacturers' Association conducted the necessary research of world markets? Are they organising the industry as a whole with long term plans in view to ensure preserving the home market for British toy manufacturers, and to capture Britain's rightful share in the world market? Has any research been made into types of machinery, packaging etc.? Are statistics kept for the benefit of any member seeking to add to the export total? Are export standards set by the Association. (The *average* British toy manufacturer, for example, does not pay sufficient attention to finish, even for the home market).

The potentialities are there, both home and export. But neither can the toy industry as a whole (we have referred to the alert members of the industry), nor can the aggregation of the industry—the Toy Manufacturers' Association, just "sit and take it," take the market previously supplied by Germany and Japan inclusive of their pre-war portion of the home market. We issue the warning—Remember 1919! German toy manufacturers, despite the 1914-1918 war hate, co-operated in re-building their toy industry, made serious inroads into the British home market, and recaptured their lost world market.

And a report has reached us through a prominent member of British industry that one of Germany's largest toy plants is intact, untouched by bombing! And, it is his view, based upon extensive and personal knowledge of German and European toy plants and toy industrialists, that invasion of the British and world toy market may occur again backed by the inventive genius and assiduous co-operative endeavour of the German toy manufacturer, as soon as Britain's present financial stringency is alleviated!

More new modern-built toy factories are needed. In many instances machinery re-

quires replacement by up-to-date plant. Where old-fashioned methods of production exist, they need to be replaced by those of highest technical perfection. Packaging in some cases needs revision—for example a scooter with wheels and front hand-piece detached, but easily capable of assembly by the purchaser is more economic and convenient in transportation and storage.

Toy manufacturers with plants converted from war production are attempting the well-nigh impossible task of satisfying the home market, and at the same time (which they are accomplishing) devoting 25 per cent. of their total output to export, in which they are making a notable contribution to the national economy.

Pre-war output, as has been remarked, did not fully supply the home market.

The mass of workers have come into the market. And, pre-war the present accumulated insatiable appetite for toys did not exist. One manufacturer recently requested his trade publication to cease his small advertisement as it was bringing him too much business. Another firm literally begged that their name should not be mentioned by us in this article in case it brought them any more business!

Big Production Plan

So many toy factories were being set up in South Wales, remarked Sir Stafford Cripps in a recent speech, "that it looks as if South Wales might become one of the principal centres of that trade." In Scotland, where a light industry programme is in being, we note a lack of appreciation of the value of toy manufacturing, both for export and for the domestic market.

It may come as a surprise to industrialists who merely look on the toy industry with an affectionate regard, engendered by childish pleasure in the intimate family circle; that, for a toy so small that it will easily go into a vest pocket, it cost the manufacturer £4,000 for design, tooling and other equipment before it went into production. Such a toy is a baby jeep 3 inches long, which, from the United States alone, will earn thousands of dollars, selling there for 1 dollar 50 cents (including 70 per cent. duty).

Toys may be romantic, toy-making in Britain may have its original foundations

laid in a friendly family atmosphere, workers may return to the factory after lunch happily chatting and laughing, but the larger toy plants of Britain are as scientifically organised in production and management methods as any other industrial undertaking.

We visited the world's largest toy factory under one roof situated in west London. Time did not permit, unfortunately, of a visit to a large north-west England factory, the name of which is a household word. Although this London factory had not made a single toy for five years, and had only initiated production last August, exports already showed an increase of nearly seventy per cent. over pre-war exports. Employees numbered three thousand, practically all of whom had had to be freshly trained or re-trained.

Additional factories had been acquired in Wales and Ireland to increase the output to meet home and export demands. We instance this firm as only one example.

Above the desk of the sales manager was a map of the world. There was hardly a country which had not been "invaded" with their toys—France, Greece, Roumania, Paraguay, Canary Islands, Egypt, Syria, Siam, are only a few places chosen at random. Brightly painted scooters were being reckoned in production targets in the thousands, and clockwork and mechanical toys in the tens of thousands and more.

A few statistics may be interesting. In 1943, 777,895 children were born in Britain. Assuming just one toy each a year for twelve years, such would represent over nine million toys. There were 10,233,139 families in Britain according to complete census figures, now out-dated.

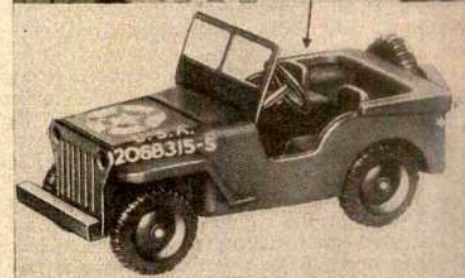
Only two toys per family would represent over twenty million toys. That is Britain only! The child appetite for toys to satisfy imitative and creative instincts, quite apart from the amusement aspect, is a natural one and does not need to be created—witness the toys of ancient Egypt before advertising was known, witness the Eskimo child's doll of bone and baby sleigh of ice and moss, the poor Japanese child's willow stick with the end shaved to represent hair, the Korean youngster's piece of bamboo with face powdered (not painted) and grass for hair, even the young Basutoland and Bechuana-land wives who satisfy their maternal instincts by carrying a doll until a baby is born.

How does the toy industry affect other industry? A healthy toy manufacturing industry in Britain absorbs substantial quantities of steel and other metals, fabrics, dyes, nuts, bolts and other fittings, plastics, cork, kapok, reclaimed, synthetic and real rubber, tools, paper, cardboard, thread, needles, iron, steel and brass wire, clay, wood, ribbon, tape, cord, glass eyes, celluloid, paint and leather, to mention only a few items.

A substantial toy industry affects prime costs in many diversified industries. We quote from our issue of October, 1945, in which appeared "Leipzig is Finished—Let London Take its Place,"—"Scrap metal and swarf



The Doll population rises post-war and thereby hangs another housing problem—Again the call is "Houses—more Houses"



Multum in Mino—dollars for Britain. Tool up of this little masterpiece cost its makers £4,000. It sells in the States for 7/6



Petrol rationing or not, the youngsters' cars are eagerly awaited. Here the post-war models roll off the assembly line

provided the raw materials for the great German toy industry. Germany's metal toys, produced cheaply and sold cheaply were known the world over." To which we add, that any scrap metal, scrap paper, or scrap of any sort, capable of utilisation in another industry, such as the toy industry, in the category of *raw material* to such an industry, serves to reduce prime cost not only in the industry which supplies it, but also to the purchaser of the products of such industry.

The toy factory, of course, engaged in mass production must, for economy in production and handling, have such scrap or offcuts which they may use, in a form so that the prime cost to it of such material (including fabrication and handling labour) is an economy over the purchase and fabrication of new material.

In a small factory we saw being used—off-cut bends from an aeroplane factory, cardboard packing cylinders (for engine boilers), off-cuts from wood, fabric, and plastic materials.

We saw toys destined for United States and elsewhere from Britain's largest toy factory bearing the advance flag of British trade to every corner of the earth. On a toy trolley bus was advertised a meat extract inalienably associated with fraternal regrets over a bovine decease. Toy shops displayed wares for sale carrying the names of British products.

The road lies open to a great advance in the British toy manufacturing industry. The potentialities in the export market are tremendous. A near monopoly, permanently held, in the home market is no small stake.

In the export market, however, strong competition can be anticipated. The factor must not be left out of account that all the Dominions have developed their manufacturing industries, and that in the Dominions and U.S.A. are as likely to be found spare factories as in Britain. Already in Canada the Canadian Playthings Manufacturers Incorporated have refused a permit to British manufacturers to exhibit at their annual fair.

We must therefore strongly recommend the British Toy Manufacturers' Association to revise their attitude both to the Press and other publications.

And now we leave the realms of toy trains, boats, working models of aeroplanes, motor cars, paper novelties—100 million crackers per year were sold in Britain alone, model theatres, paints, educational games, and puzzles, many suffering in production from material shortages, and enter a sphere of the industry where the mention of the word "toy" immediately renders the visitor *persona non grata*—the sphere of scale working models of ships and trains complete with railways and accessories.

Here craftsmanship reigns. There is no assembly line. Cost and output per man hour belong to another world. Target is exactitude, quality and operational efficiency. Competitive prices do not govern. The high-speed top-efficiency executive visiting this factory may take a rest.

The contribution, in actual exports, to the export market from the working scale model industry is not great. Particularly in model railways the boys and adults of other countries wish to buy models of their own country's railway engines, rolling stock and railway equipment, operating according to the railroading customs of such countries.

The industry, however, makes substantial contribution to supplying industries in its purchases of high quality materials, and enjoys a high-priced home market of no small size. Nevertheless no mean part is played abroad in advertising British engineering and shipbuilding. Such railway models as reach other countries, and the working models of ships, and the scale exhibit models of British-built ships pay high tribute in all parts of the world to the engineering and shipbuilding skill, technical perfection and quality of British factories and yards.

The prominence which model railways enjoy as a hobby for young and old may be gauged from the number of technical books published on both construction and operation according to orthodox railway practice, quite apart from periodicals on the subject.

We visited a scale working model railway and ship factory. The war-time story of this plant would make extremely interesting reading.

The plant played a supremely important part in the training of naval officers, in submarine operations, in the training of the army in quick assembly of Bailey Bridges for which scale models were built, and in experiments concerning capacity check-up of, and the loading and unloading of landing barges, in which the operations were carried out in scale models.

Important technical changes in construction resulted from the firm's experience in assembling certain models.

Here we found scale models (non-working) of the latest in British motor cars which will bring orders to Britain's motor car industry from numerous countries abroad.

Although perhaps to some extent invisible, the contribution of these models of railways, ships and aeroplanes to Britain's industrial life and prosperity is full scale.

Glass—



Let it Be Known There *IS* Work

*Then Plant and Craft will March
Together and Produce the Goods*

By JOHN RAYMOND

General Manager, Chance Brothers Ltd.

IN our Glass Works, we decided that the only possibility of competing with foreign manufacturers (and by this I mean mainly Czechoslovakia) was by a fairly extreme degree of mechanisation. With our wage standards many times higher than those in the European glass industry and with subsidies and other natural and artificial advantages which manufacturers in these countries enjoyed pre-war, we came to the conclusion that this was our only possibility of competing. Further, we have of course been told by the Government that full employment is to be its policy and our decision to mechanise was influenced also by the fact that we cannot anticipate obtaining sufficient skilled hand glassmakers to handle the output we visualise.

It is well to remember that pre-war, well over half our requirements of what we call Lighting Ware and Domestic Ware (that is, glass lamp shades, ashtrays, salt-cellars,

tumblers, etc.), were imported. Having regard to our post-war situation, there is obviously an urgent national need that these imports should be replaced by articles made in this country. The only means of doing so at reasonable prices is by mechanisation, involving the expenditure of very considerable sums on new buildings, new furnaces and new equipment of all kinds.

Following the decision to increase output by mechanisation I visited the States to learn how they have mechanised, not with the intention of blindly copying them, but to see what they had done and then modify their thoughts and equipment so as to meet the conditions resulting from our smaller market, different tastes and the British people's desire for greater variety.

Over the years we have gradually eliminated more and more of the unskilled work in glassmaking. For instance in the old days each glassblower had a young boy as his own

personal assistant, who opened and closed his moulds. We designed a curious machine operated with the blower's feet so that he could open and close his own moulds. Thus young boys entering the trade do not now have to enter a "blind alley" job but immediately start to learn "gathering," one of the skilled operations in glassmaking.

For many years we have supplied markets all over the world with wired glass for roofing, many patterns of partition or "figured" glass, as we call it, optical glass, and have exported many such specialised products to America. We were able to do this, I believe, firstly because we tackled our expansion problem at the beginning of the war with more vigour than the Americans, and secondly because we started with a better knowledge of optical glass. We ignored the temptation to try new methods, devoting our energies instead to detail improvements and greater output.

Tenfold Increase in 10 Years

As a result, our output probably increased ten times in ten years, the increase in man power being about half that of output. This was achieved as a result of the steady introduction of the improvements I have referred to. Our object in the first instance was not to reduce costs but to increase output. With limited available man power this was only possible of full realisation with an increase in output per man hour. Nevertheless a practical result is that our optical glass is now one of the very few products selling at almost pre-war prices, these having only been increased by approximately 10 per cent. since 1939.

Optical glass was sent to America even during the war. Incidentally, we believe we know more even now about the manufacture of optical glass than the Americans and at least as much as the Germans ever did.

It was anticipated that the introduction of mechanised manufacture might arouse opposition from our craftsmen. It was natural that they should be proud of their craft and suspicious of action which might replace it. We can say with truth, and a good deal of pride, that our employees have on the contrary given us full co-operation.

On one occasion a workman actually said to me: "I can't understand why you seem to be nervous of mentioning mechanisation—we are just as interested and keen for it as you are." I think they realise that machines and their own craft must operate side by side if we are going to be competitive.

Certain products can only be produced by handcraft; others, where large quantities are involved or where the design is suitable for mechanical production, could not be produced competitively by hand methods.

I consider it is essential that we get rid of the ingrained fear of our workpeople that if they increase output they will eventually find themselves out of work.

The solution of the problem is three-fold—



Mechanisation has stepped up output. Here at the end of a conveyor belt, girls roll glass-wool into 9 x 3 feet mats which have been automatically cut

the Government, the Employers and the Trades Unions must all do their part. I feel it is up to the Government to take the lead as we employers, however honest we may be individually, tend to be "tarred with the sins of our fathers" and as a result there must be some mistrust.

It is therefore difficult for us to get across to our workpeople the fact that there is work available for them for many years to come and the harder they work the more they are helping to establish conditions under which they will have a decent standard of living.

I do not think that the average modern manufacturer would be guilty of cutting piece-rates. In this works we certainly would not dream of cutting a rate except under conditions which were agreed with the Trades Unions. We know that nothing upsets labour so much as being asked to work on piece-rates and then operating under conditions which from the workers' point of view are not to be trusted.

I think there is too much talk at the moment to the effect that the British workman does not work as hard as the American. No doubt he is tired and fed-up after six years of war—as well as six months of what I think of as the "phoney" peace—but I believe very profoundly that often when people complain in this respect, the fault is partially with management in its failure to manage.

It is a major part of all our jobs to see that our employees do a good day's work and to do this by example, encouragement, discipline and the stimulus of direct incentives. Often these qualities are lacking and then who can blame the workman if he idles. Of course this is not the whole story.

There must be some truth in the criticism that we Englishmen are easy-going except during times of crisis. There is also the question of Income Tax deductions and the fact that there is very little in the shops to buy, which means that there is at present



Complex top quality products set the industry an output problem which only good management can solve

not much incentive from the monetary angle to the British worker to put that extra ounce into his job.

I feel sure that if we could, by some means, fill the shops, if indirect instead of direct taxation at the lower levels was introduced, and if Management did its job as I feel it might be done, our output per man hour would increase very substantially.

I am quite sure that we have not spent as much money on machinery and such as we ought to have done during the last twenty-five years. This is an indictment of management and industry during the years from 1919 onwards. I am told that conditions were so uncertain in those days that owners of industry would not risk sinking large sums in their businesses but I suggest that this was a short-sighted policy having left us as it has with industries often equipped with old or insufficient machinery and plant.

Of course there have been exceptions and the commercial success of such more enlightened companies is an indication of the soundness of the policy of installing as much and as modern horse power per man as possible. We, like certain other firms I know of, are now making great endeavours to bring ourselves up-to-date as quickly as we can and large sums of money are being spent with this object in view. In our case, our aim is to make ourselves the most modern glass works in Europe and we shall be bitterly disappointed if we fail.

We must learn to be less careless with labour. While in America I was very interested to notice that labour was very seldom used carelessly, no doubt in part due to their higher rates of pay. For instance, where we might use ten men to move a casting into position, they would use one man and a crane. We must learn to use labour just as economically.

In our case until quite recently we employed a gang of specially fit individuals for unloading trucks of coal by hand. We came to the conclusion that this was one of the

jobs for which we would not be able to obtain labour in the future and so we purchased and installed a mechanical grab which does more work with fewer men at lower cost and with no appreciable physical effort.

"Blind alley" jobs for young people are obviously not going to be filled in the future and we are trying to eliminate these occupations as far as we can. We want to give every young boy an opening which will take him just as far as his abilities allow. Although we are comparatively small, we have our own Apprentice Supervisor and each boy is watched individually and moved from job to job until he gradually becomes settled in the kind of occupation where we feel he will achieve the best results and to which he is most suited. The boys are allowed time off during the day to attend school and are given special training according to their individual leanings. In certain cases the boys are sent to University.

We Can—If we Will

Our Apprentice Scheme has been evolved mainly to train skilled tradesmen. These men are the back-bone of British Industry and our strength in this direction represents one of our advantages as compared with the Americans. I have heard of Apprenticeship Schemes under which all the emphasis is on boys who may be sent to Universities with a view to becoming technicians or other classes of non-direct workers.

This is, I am convinced, positively dangerous as it tends to suggest that only second-rate youths should become productive workers. In point of fact, we want at least four producers to every one non-direct worker and we should direct our ideas so as to increase the respect in which skilled manual workers are held.

I believe the figures which are quoted as representing the outputs of the British and American workers are an indictment of our Industry. The difference of 1 to 4 cannot be accounted for purely by one man working harder than another; it must be because, as I have said before, he is better equipped. It must be that we have not given our workers sufficient of the right equipment, nor have we stimulated them to a sufficient extent and it can probably also be said that the British workman himself is not quite so willing to work as the American.

What I have said must not be taken to imply that I am pessimistic about British Industry, because quite definitely I am not. All the instances where I feel we are at a disadvantage can be cured. On the other hand, we have special qualities and experience which cannot be bought or learnt, such as flexibility, resilience, reputation for integrity, knowledge of such matters as international banking, foreign trade, etc.

I am convinced that provided we use our abilities as fully as possible, we can, with our characteristics and experience, lead the world. But we have got to make up our mind that we are going to do it.

Business Calling . . .

Quotes the Policy of Leaders Helping to Shape Peace Plans

Mr. A. E. SYLVESTER

Uncertainties of Nationalisation



VIEWS on the proposed nationalisation of the fuel and power industry come from Mr. A. E. Sylvester, F.C.A., the Governor of the Gas Light and Coke Company. "The thing that troubles me most at the present time," says Mr. Sylvester, "is the lamentable state of uncertainty that has been created. It seems to me that the worst aspect

of the Government's decision is the long gap which must elapse between the announcement of the decision in the broadest possible terms and its implementation, which may not take shape until a year, or even two years, later. This state of uncertainty, if it continues for much longer, will have serious effects upon the industry itself and may even bring the experiment to failure."

Mr. Sylvester makes another statement which will have a particular interest for industrialists in the Company's area. He says that the Company is now in a position to make reductions in the price of gas, and goes on: "We have made a very careful analysis of our costs and the way they are attributable to various classes of business at various ranges of consumption, and we feel that it is our first duty to cheapen the price of gas to those consumers who take a reasonable amount. Hence we hope to introduce a simple block rate, of which the first small block will be at the existing rate and the subsequent blocks at lower rates."

Capt. A. R. S. NUTTING

Improve Travel Facilities

CAPTAIN A. R. S. Nutting, O.B.E., M.C., chairman of the Westinghouse Brake and Signal Company Ltd., gives two useful hints to the Government for its efforts to step up the export trade. He says: "The present Government and its predecessor have realised the absolute necessity for this expansion of our foreign trade. If the desired object is to be attained within a reasonable time then there must be unstinted co-operation between Government Departments and the export industries. Travelling facilities, and in particular air travel, are required now

by exporters. We must be able to get our agents and representatives abroad now. They need to be able to go abroad and get back with much greater ease and much less difficulty than at present."

Mr. H. J. BOSTOCK

A Lead from the Shoe Industry



REVELATIONS about the shoe industry, which may contain policy pointers for executives who are endeavouring to step up P.M.H., come from Mr. H. J. Bostock, J.P., Chairman of Lotus Ltd. "In our industry," says Mr. Bostock, "relations between manufacturers and operatives are controlled by a National Conference extending

over a period of more than 50 years. Clause 12 of the current agreement says: 'It shall be obligatory (1) on the part of the employer to pay the full rate of wages for all output; (2) on the part of the operatives to use their trade skill and productive ability to the best advantage and fullest capacity and with no restriction of output following a change of organisation or machinery.' The restrictions that in many industries appear to discourage production happily have no counterpart in shoe factories."

Mr. C. G. VOKES

Another New Industry



DETAILS of what may well become a vital new industry come from Mr. C. G. Vokes, A.M.I.Mech.E., A.F.R.Ae.S., M.S.A.E., M.I.A.E., managing director of Vokes Ltd. Mr. Vokes states that at one time it was usual to start thinking whether filters would be needed when some considerable trouble occurred with equipment, but by 1943 all the Ser-

vices had realised the extreme value of filtration and, generally speaking, when undue wear and tear occurred, or when operation

was unreliable, the authorities immediately thought of filtration as the cure and almost without exception this was so.

"The war has proved conclusively," he says, "that the new industry of scientific filtration is going to be of considerable importance. Those who were doubtful as to the remarkable effect in the saving of wear and reduction in maintenance of aircraft, vehicles, and other equipment before the war were utterly convinced after it had been in progress for a short time. To-day filters are being asked for and specified on all kinds of equipment on which it had never occurred to anybody before the war that they were necessary."

Sir GEORGE H. NELSON

Problems of E.P.T.



ATTENTION to the E.P.T. problems of big concerns is drawn in a speech by Sir George H. Nelson, M.I.Mech.E., M.I.E.E., Chairman and Managing Director of the English Electric Company Ltd. "Naturally," says Sir George, "we are anxious to get rid of E.P.T. as soon as possible because of the unfairness with which it operates as between one

company and another. But we would urge that in whatever arrangements the Chancellor may make for terminating this tax he should recognise the special burden of reconstruction expenditure on companies like ours that have played a great part in the manufacture for war purposes of products outside their normal fields.

"Owing to the shortage of labour, designers, and skilled workmen, the changeover may not be completed by the end of 1946, and it is necessary and right that the termination of E.P.T. should be so arranged as to allow reconstruction costs incurred after that date to be written back into the E.P.T. years, since it was the work done in those years that has given rise to the reconstruction."

Lord ROYDEN

Fight Nationalisation

POSSIBLY the most forthright statement yet made on behalf of a private enterprise threatened with nationalisation was that of the Right Hon. Lord Royden, C.H., the Chairman, at the twenty-third annual general meeting of the London Midland and Scottish Railway. "I believe," he said, "and I am confident that my belief is shared by the vast majority of the stockholders in this railway, that nationalisation of railways would be a misfortune for the community and inflict serious damage on the industry of the country. It is therefore in the public interest that we should oppose it by all lawful means, and we intend to do so."

Lord Royden made out a detailed case for the retention of the railways by private enterprise, one brief extract of which is as follows: "Since 1939 we have passed through the most severe test which could have been applied to our undertaking and with complete success. The railways are still working under the rigorous limitations to their profit-earning capacity which Parliament laid down in 1921, and as an additional handicap imposed extremely onerous conditions from which our competitors in other forms of transport are entirely free.

"In spite of this in those disastrous pre-war years when we received so poor a return on our capital, we spent immense sums on new plant, equipment, track, and signalling. Thanks to this expenditure our line and equipment were, at the outbreak of war, in a higher state of efficiency than at any time in our history. This expenditure on development, the fruits of which did not accrue to you but to the whole community, was the profit motive in reverse. The nation, not we stockholders as such, reaped a rich harvest where we had sowed."

Lieut.-Col. ALBERT BUCKLEY

Staff Training



INTERESTING details of a staff training scheme have been given to the shareholders of the Liverpool Gas Company. At the ordinary general meeting the Chairman, Lieut.-Col. Albert Buckley, D.S.O., J.P., stated: "During the war 924 men and women were called up for active service or directed elsewhere in the national interest. Slowly but

steadily they are now returning to the company, and on behalf of the directors I extend to them a cordial welcome and express the hope that they will soon be resettled in the service of the company.

"Many of these men and women have lost valuable years of training and experience, and early in 1945 we decided not to wait on events but to provide and run in co-operation with the local education authority our own training centre, so that returning employees might receive a specialized course of training the better to fit them for their peacetime task and further to provide refresher courses for other employees so that they might be kept abreast of new developments. I am pleased to say that this vocational training centre is now in operation and your directors have decided that any gas undertaking in this region which has shown an interest in the venture may have an opportunity of sending its trainees to the centre at an appropriate fee. There is no doubt that this enterprise will yield results of much benefit both to employees and customers."

ARTHUR J. ELVIN FINDS

Sport is

By
**ELIZABETH
EWING**



MILLIONS who shared the communal life of war factories for recreation as well as work are seeking their post-war entertainment in groups and not as individuals. People who teamed up as street fire-guard parties to defend their homes or who were banded together in the Home Guard feel the same. When the time for recreation comes they want to get together, to do things not as separate entities but in parties, going out together and forming part of the vast concourse of people watching a big sports event.

Watching this tendency closely in the conviction that it is a significant trend of to-day is Arthur J. Elvin, Managing Director of Wembley Stadium. He above all others can satisfy this demand.

In his office in the Stadium buildings, overlooking the scene of his plans for a better and busier Wembley, he presides with the benevolence, the solicitude and the unswerving authority of a father—the father of a pre-war two million visitors a year, whom he expects to increase still further as soon as events to attract them can be arranged.

Quiet, businesslike, orderly as a City man and with none of the traditional flamboyance of the sportsman, Arthur Elvin is assessing this need and satisfying this demand. For Arthur Elvin is Wembley and Wembley is Arthur Elvin to a degree that is true of very few successful business men and of equally few vast, many-sided organizations.

That fact is the key to Elvin's whole character and achievement and in particular to the extreme efficiency and success with which he has pursued his chosen career—a career in which he has no rival in the Empire and possibly in the world today.

Wembley is Arthur Elvin's job—the job he found for himself. He is satisfied to do that job and wishes for nothing more than to go on doing it. He never forgets that it was he and no one else who turned post-exhibition Wembley from the world's biggest white elephant into the biggest, best-run and most comprehensive sports centre in the British Empire. And however vast the sweep of his enterprises and developments as Britain's number one sports promoter he never relaxes from the close, unrelenting attention to the smallest detail which typifies the perfect fusion of the man and the job.

In an age like this when success is apt to mean the piling up of divergent interests and the accumulation of directorships Arthur Elvin limits himself to Wembley. He has time and again been pressed to extend his range, but he is not interested. I could have added other interests, he will say, with an air of slight surprise. He supposes that he would make more money if he did. But he doesn't want to. That wouldn't interest him. And Wembley does.

His career, his interests, have therefore a close-knit unity that would have delighted Aristotle and which seem (though the idea

would probably startle Arthur Elvin) to have something classical about them—something that is refreshing and stimulating in our confused age.

There is, too, something like the classical irony in the fact that the man who has built up Wembley got the idea of doing so when he was engaged as a demolition contractor on the Exhibition buildings. It was when pulling down the futile minarets and faded ferro-concrete pavilions that sprawled over those acres of north London that the conception came to him of a great sports centre rising there.

During the Exhibition he had been employed in a tobacco kiosk at the entrance, so he knew it well. He had made some money there by acquiring some shops near the kiosk and stocking them up with goods. Now he managed to buy one or two buildings and instead of breaking them up he sold them.

One became a laundry in Glasgow, another a furniture factory at Letchworth. With the profits he went on buying. Eventually he bought the Stadium from Jimmy White, cautiously negotiating to pay over a period of ten years. White's sensational suicide caused a demand for immediate payment from the receivers. Somehow Elvin raised the money, paid £122,500 for the Stadium, sold the latter to the Wembley Stadium and Greyhound Racecourse Ltd., and netted a profit of £27,500. He took this in shilling shares and became managing director. That was in 1927 and he was as old as the century.

The son of a Norwich policeman, he had been left fatherless at the age of ten and had successively delivered newspapers, worked in a jam factory, a boot factory and at a grocer's. He had come to London

and been employed by a soap manufacturer, had joined the Royal Flying Corps in 1917 and been shot down and held as a prisoner of war until 1918.

In pace with the Century

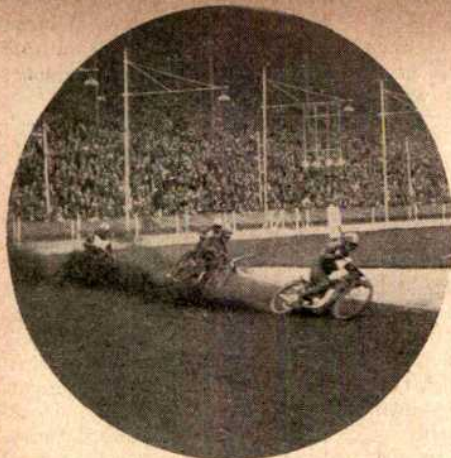
He had undertaken demolition work on the Continent before reaching the tobacco kiosk. Now he had found the job he wanted. All that remained was to build it up. Looking back today, he doesn't regret any of these other jobs. Move around as much as you can until you find the right job, he will advise young people, but once you find it stick to it and work at it as hard as you can. His own purpose was clear in 1927. It remains as clear and quite unchanged today.

In the nineteen years that have passed since then Wembley has seen, in addition to Association football finals and internationals, the introduction of greyhound racing (the first event under the Elvin régime was a greyhound meeting on December 10th, 1927), ice hockey, professional and amateur Rugby football, boxing, indoor lawn tennis, speedway racing, indoor athletics, six-day cycle racing, table tennis and international swimming. All that has been Arthur Elvin's responsibility, and until the war attendances at these events had risen steadily to something over two million people a year.

But the man who plans all this is not interested in sport as sport. He doesn't know the name of one footballer from another. The only game he plays himself is golf, which he says he plays very badly. He attends every event at Wembley, acting as steward at all greyhound meetings and as clerk of the course at all speedway events, but he does so in order to see that every-

WEMBLEY—THE MECCA OF SPORTSMEN





THRILLS—

thing is running perfectly smoothly. There is nothing of the impresario enjoying the limelight in his presence on these occasions. He is busy watching everything that goes on with a critical eye, ensuring that his rule for Wembley "nothing but the best" is being maintained. He always has an attendant at his back to see to any hitches that probably only he will notice.

Sometimes this attention to detail causes headaches among someone or other in the staff of 300 working under Elvin. Once a Cup Final programme was prepared and when it was all complete proofs were shown to him. At the head of it was a picture of the Stadium. "Why," he asked, "is there no flag flying on the Stadium tower?" No one had noticed, but a new block had to be made showing a flag.

Another reflection of this passion for detail is the meticulous attention Arthur Elvin gives to letters of complaint or criticism or to those suggesting improvements in the amenities provided. Even if anonymous, all are gone into exhaustively—too exhaustively in the view of some of the staff.

It is consistent with Arthur Elvin's attitude to Wembley that he should count loyalty high among the virtues, prize it in his staff and reciprocate it in his own dealings with them. Without exception his executives are men and women who joined him at the very start of his rule at Wembley.

With all heads of departments Mr. Elvin keeps in close, continuous contact. He likes to keep his finger on the pulse of every department, and he is always the "guv'n'r," to whom decisions are referred. Heads of departments are responsible for their departments but to him personally. He does not favour conferences and democratic round-

table exchanges of views as a way of getting things done. He meets his executives one by one, receives their reports, puts forward his views and gives instructions. "You can do it," he will say; or "Don't say it can't be done." He refuses to believe that anything is impossible.

They call him the "guv'n'r" and final decisions rest with him. If, for instance, an advertisement campaign is being planned, he is not content simply to allocate the money and hand the whole matter over to the advertising department to deal with. When the details are worked out the matter is referred back to him for his personal approval.

Inevitably this rigid central authority means that there is a certain lack of flexibility in the running of all the manifold activities at Wembley. The young, the eager and the enterprising are sometimes conscious that the benevolent despotism of Elvin is hardening a little as the years pass, and that a certain generous warmth of shared initiative which could glow through the organisation is incompatible with his methods.

But such flexibility would mean weakness to him and would in his view lend itself to inefficiency. And after all he is Wembley, and he is intensely conscious of being responsible for £480,000 worth of public money (with a present-day capital value of £1,500,000) and of having a duty to see that it is used wisely.

He acts boldly, and always on his own initiative, relying on his own judgment. Almost always he is successful: his achievement in drawing a gate of 10,000 to watch table-tennis, which all his advisers predicted would be a complete flop, is an example.

Nowadays at Wembley they talk of "the Elvin luck" with regard to new ventures,



SPILLS—

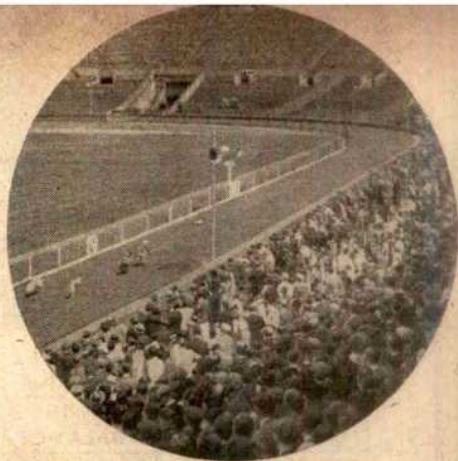
that close knowledge and indefinable sense of the public taste which makes the great promoter. With Elvin, however, it even seems to hold good where the weather is concerned. Very, very rarely is any outdoor event washed out by rain: the only outstanding occasion that can be recalled is the open-air boxing contest between Petersen and Walter Neusel in 1936, when a crowd of 50,000 sat in the Stadium while torrential rain poured down upon them. Hundreds of the famous crept to their cars at the end looking as though they had been shipwrecked. After that there was no more open-air boxing.

The World comes to Wembley

In his dealings with his staff, too, Elvin often displays a sense of humour. Once a boxing promotion was going badly as far as bookings were concerned. Elvin pressed for further publicity to be given it. Nothing appeared in the papers as day after day passed. "Well," he said disarmingly to his press secretary, "you'd better be careful—it's bound to leak out sometime or other."

The range of Arthur Elvin's activities makes it necessary for him to think and plan broadly all the time. His contacts are all over the world. He turned to America for the stars for his first indoor lawn tennis meeting and ranged the continent for players in the international table tennis tournaments. Many of his speedway riders came from Australia and his ice hockey teams from Canada.

So far as Wembley itself is concerned, the chief example of how he can think big is the Empire Pool, the fulfilment of his dream

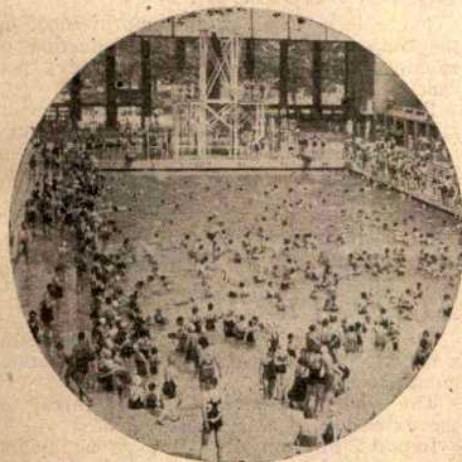


FLUTTERS—

of having the biggest indoor arena in this country or the Empire. It is the Madison Square Gardens of England, second only in size to New York's. In a particular sense it is Arthur Elvin's baby.

It was characteristic of him that when he first started planning it in 1933 the expert whom he called in was Sir Owen Williams, constructional engineer of the Wembley Exhibition and another of the old friends and colleagues to whom he instinctively turns when any new venture is being planned. Together they toured the continent, saw scores of arenas and pools—then came back and built something quite different. There is nothing in the world like this building, with its three hundred foot arena and immense roof span of 240 feet soaring ninety feet high and entirely unsupported from end to end of its four hundred and twenty feet. Architects all over the world were critical of the revolutionary principles employed, but Elvin's £200,000 venture soon justified itself. He had a building which was unique and in the years immediately before the war it was the scene of many of the world's greatest sporting events.

But what of Wembley today and tomorrow? The war inevitably produced great changes, but though there was a slump recovery followed. In 1944 profits were £157,000 and last year they jumped to the highest ever at £386,000. Activities at Wembley raised £150,000 for the Red Cross during the war and other war charities, and the Stadium and grounds were used for all kinds of Service and Civil Defence purposes, including demonstrations and training. Elvin received the M.B.E. not long ago.

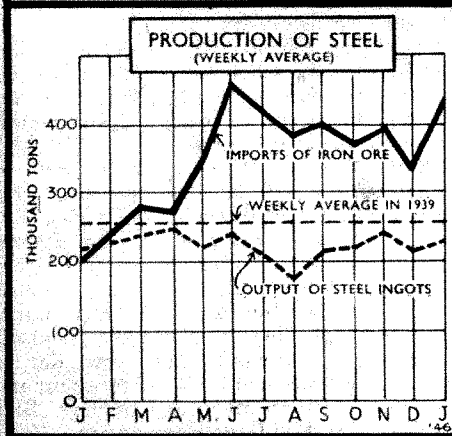
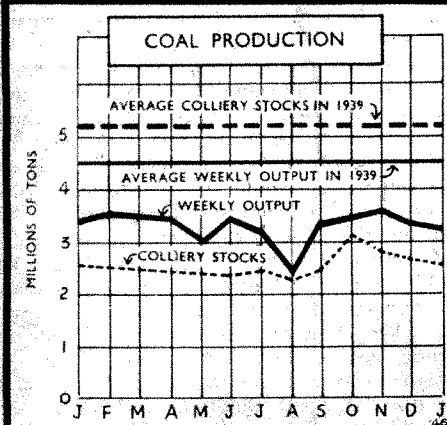
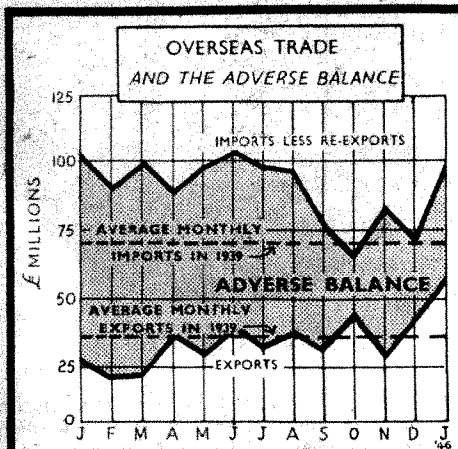


FITNESS—

Please turn to page 88

TREND OF TRADE

By D. C. TERRETT



THIS is no time for gloom about our trade prospects. It is only necessary to look across the Atlantic to put our own position into perspective.

Much of American industry is working at the lowest levels of activity for five years and the whole U.S. business outlook is obscured by labour troubles and price controls.

The position here is that reconversion is going better than is generally believed. With the exception of coal output, the basic factors in the situation compare very favourably with a year ago.

This is an extremely creditable performance in view of the difficulties which have confronted industry in the change over. The all-out drive for more production which the Government are urging is a measure of our difficulties on international trading account and not a reflection of any shortcomings in the progress of reconversion.

The trend in exports is decisively up and there has been some reward for the effort to close the gap between imports and exports. At the beginning of 1945 the monthly gap was £74.5 millions. At the end of the year it had been reduced to £39 millions.

The average monthly export of electrical machinery, railway materials, artificial silks, and practically all the principal kinds of chemical manufactures are now up to the average monthly level of 1938.

Exports of iron and steel, and of total machinery are over half the average monthly level of 1938.

These industries have to make up, however, for the loss in coal exports. The average for November and December was 428,000 tons compared with a monthly average export in 1938 of 2,988,000 tons.

COAL PRODUCTION

There is no sign of any improvement in the output of coal. Weekly production is running on a fairly even keel some 5 per cent. below the levels of a year ago.

But in the meantime we are living on our stocks. These have declined persistently during the past twelve months and are now down to less than 2,200,000 tons or only four days' output.

Stocks of coal held before the war were maintained at well over double this figure, generally in excess of 5,000,000 tons.

STEEL PRODUCTION

Steel output is being well maintained, with a slightly improving tendency apparent from month to month.

The coal situation is a definite threat to the extension of this improvement.

Imports of iron ore have risen rapidly throughout the past year to reach the pre-war levels.

Exports Improve Steadily

SHOP SALES

The index figures of retail trade are hitting the highest points ever touched.

Particularly is this the case with sales of household goods. The January sales in this department were, for the whole country, some 18 per cent. above the average for 1939. The increase was general in all regions, but most pronounced in the London area. This is a clear sign of the progress of reconversion as well as of the rise in the price level.

Factories making hardware, vacuum cleaners, electrical appliances, wireless sets and similar household articles which were all engaged on munitions work are now once more supplying the consumer with much needed goods. There are also more supplies of furniture.

The advance in the total index for all departments is much more restrained owing to the influence of rationing and clothing coupons. The money sales of clothing are now running some 15 per cent. below the average levels of 1939.

COST OF LIVING & PRICES

The Chancellor's determination to keep down the Cost of Living is shown by the Official Index which has registered no change since last August.

The same control is not being exercised over the prices of basic materials. There is a steady but pronounced upward tendency in the wholesale price index.

The last few months have seen higher price for such basic materials as steel, lead and paper, and the total index is now some 3 per cent. above the levels of a year ago.

The tendency here and in the U.S.A. is strongly towards still higher levels.

EMPLOYMENT

The movement of labour into the key industries is proceeding as fast as the demobilisation of the forces will permit.

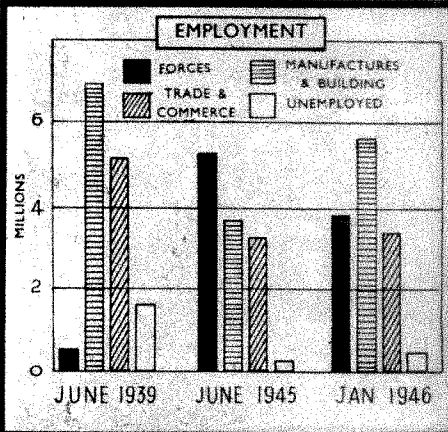
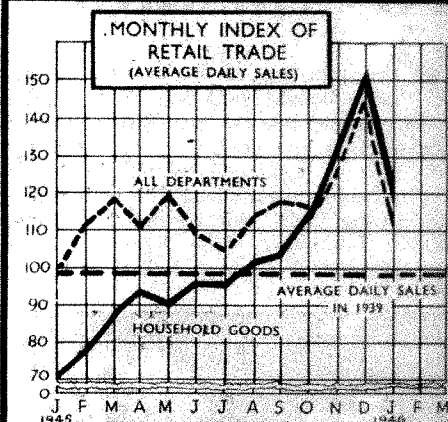
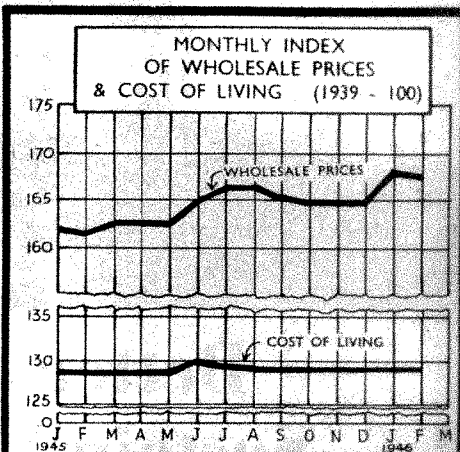
The improvement since V.E. Day is well marked in the accompanying chart. The numbers engaged in manufacturing industries has gone up from 3,041,000 to 4,820,000.

The improvement in labour supplies for the building industry is disappointing. The latest figures show 935,000 engaged in Building and Civil Engineering compared with 722,000 just after V.E. Day and 1,310,000 before the War.

PROVINCIAL BANK CLEARINGS

The turnover in money is still mounting. The total clearings for this year to date for twelve leading provincial cities has risen to £214,495,000 from £185,559,000 for the corresponding period of a year ago.

ECONOMIC CONSULTANT





Better Models To Sustain a Reputation

ON the front page of the local daily paper that I bought as I left the Leicester L.M.S. station, ran the headline, "Jobs for 5,000 workers in Leicester." This seemed a sticky sort of position for firms situated in the City hoping to get ahead with their reconversion programme. After a half hour's talk with Mr. Backhouse, Mellor Bromley's Managing Director, I discovered that, as far as

JOHN GILBERT *Interviews*
H. R. BACKHOUSE, O.B.E.,
Managing Director
Mellor Bromley Ltd.

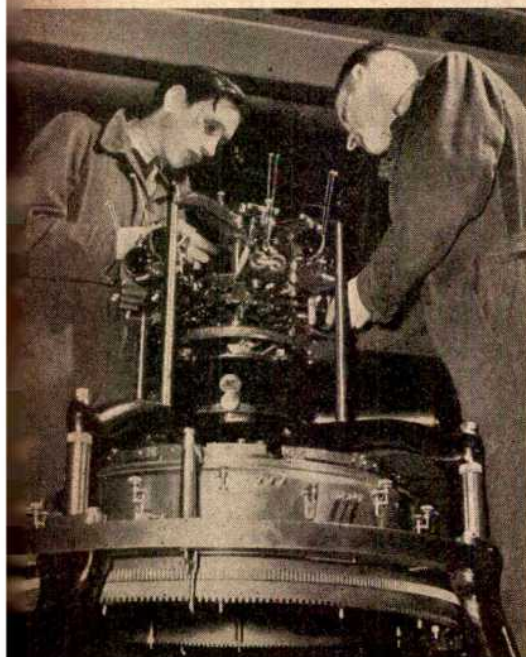
this firm at least was concerned, my fears were unfounded.

Reconversion to a firm such as Mellor Bromley from 100 per cent. war effort to peace time production, is not solely a matter of management interest, for in Britain's drive for maximum production a firm of this character make vital contributions to the modernisation and re-equipment of consumer industries. Not only is there a world shortage of textiles but also of textile producing plant . . . this is indeed an essential industry for peace.

As I was conducted round the factory, there were still traces of a wartime hang-over. Large units for Admiralty use still occupy part of one erection bay, but gradually they are receding into the background and Nylon preboarding and other textile machines are taking their place.

Turnover to peacetime production is definitely in full swing, but full capacity has yet to be achieved. Reconversion is not complete. But the firm feels confident that within six months the first peacetime production target will have been achieved.

The switchover was methodically tackled. First, re-organisation; staff workers were re-



allocated, care being taken to select each individual for a suitable post. Then a programme was drawn up, and from that programme a first capacity potential was taken; next machine tools and machine shop layout were planned to accommodate this programme, and the plant balanced to meet the first production target.

Labour in the workshops had to be re-orientated; many operations in knitting machine building call not only for first class engineers, but in addition those engineers must possess a knowledge of the knit goods industry.

Fitters, erectors and testers, with much specialized knowledge of knitting, had been handling vastly different types of mechanisms during "the lost years"—often working 12 hours per day for seven days per week for months on end.

A Reputation to Uphold

Naturally they have somewhat lost touch; they turned back to peace time products with an added experience yet without the urge that was behind the war effort.

A psychological problem added to the physical reactions; meetings were held between section leaders and management, with a clear explanation of management's problems and aims, from which much was passed down to the individual worker. Soon the old comradeship and loyalty to the company was reflected in the output. Concisely this was the policy for re-organising tools and labour.

Next the product:—Prewar Mellor Bromley knitting machines had an international reputation; a reputation unequalled in the industry for precision machines producing a fabric of such high quality, that it was used as the standard to which the products of other machines were compared . . . but for six years these machines like those of other producers were not available.

Customers were positively shrieking for new plant. The problem "should we supply the prewar types or adapt and improve to give yet a better machine to our customers." A difficult problem; to supply the old machine meant cashing in on a market which would literally absorb the whole output for some years irrespective of design. NO! keep faith with those firms to whom the name Mellor had for years spelt the most modern. So the policy was decided:—

Only high grade precision work can guarantee the accuracy of machines that set a universal standard. Post-war models of the Mellor Bromley knitting machines leave older types far behind

As Mr. Backhouse said, "We had to decide whether we should produce and market machines built to pre-war standards, or whether by introducing results of research we should start off after the war with advanced types more in keeping with our reputation of always being ahead in design."

New Product for the New Times

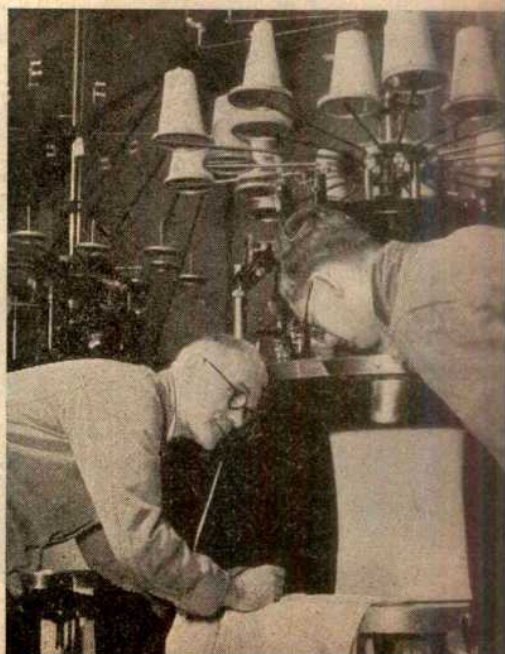
We decided that whilst the prewar machines were in demand it would be more in line with forward-looking management to strike out boldly along new lines to give to our customers the benefits of experience gained during the war."

This was a bold decision indeed, for as all of us are aware the whole question of re-designing meant that the build up of prototypes; the correlating of individual mechanisms; the creating of new jigs and tools, had to be faced.

Gradually, however, with sound planning and sound management, the designers working with the technicians, produced prototypes which proved under test to be not only worthy successors to, but an advance on the pre-1939 machines.

The inevitable delay caused, meant much explanations to knit goods producers who had for six years had to rest content with but a meagre servicing of their overworked plant.

All this was easy to explain during the war when the most intricate precision instruments for the War Office and the Admiralty had to be built and despatched to the world's



vengeance. Deadly guns that wrought havoc in the ranks of the enemy were only part of Mellor Bromley's war effort

fighting fronts, but with the cessation of hostilities it was not so easy.

However, as Mellor Bromley had turned over to wartime production utilising their peace time technique to produce ahead of schedule, so after six years on the new and deadly line-up the lessons learned have given management and worker alike a wider view of applying this new knowledge to post war production.

Thus new machines of advanced design embodying ideas culled from wartime experience will be available to the knitwear industry when it begins to re-equip—and that process has already begun, machines are reaching customer's factories. Only a trickle as yet, one machine where dozens are required, but each month will see an ever-in-

creasing flow of machines arriving at knitting mills both at home and overseas.

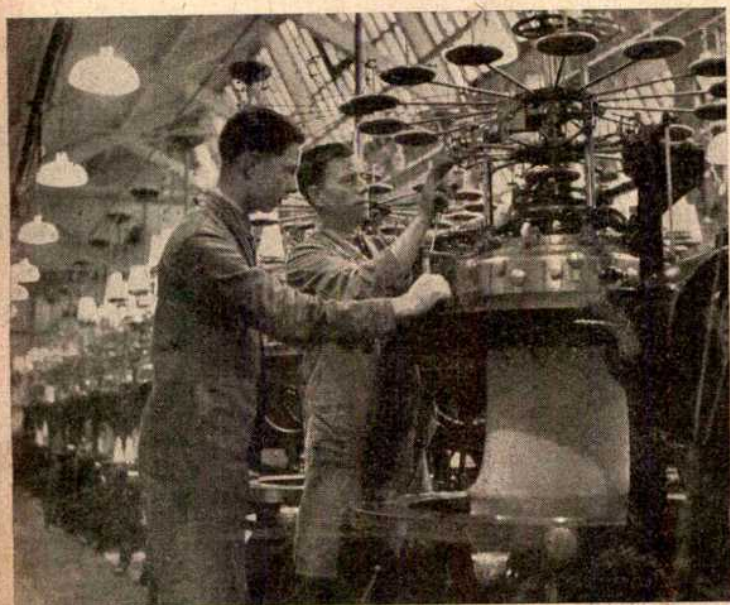
Labour, has of course, been a problem with Mellor Bromley as with others in the Leicester area. Not only is there a shortage of the right type of labour, but there is the result of six years' intensive overtime and working to fine limits to be countered.

Yet fine limits are essential in knitting machinery where high production of quality

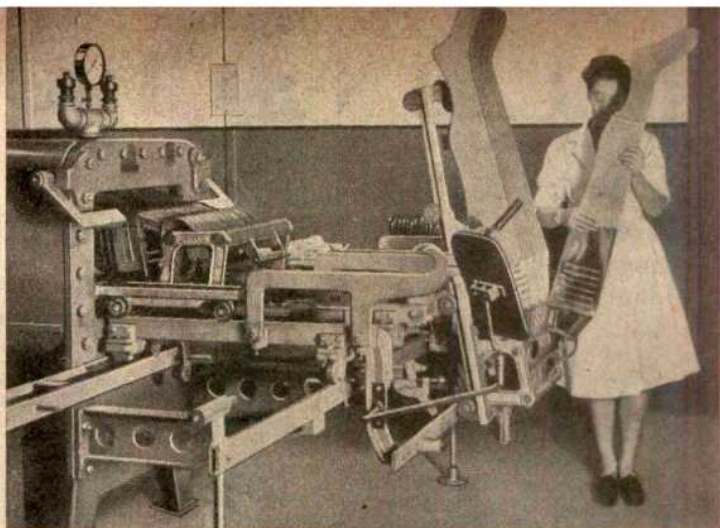
fabrics are demanded — imperfections cause loss and delay, imperfect fabric and wastage. Thus the company call for precision workmanship to ensure freedom from trouble and breakdown.

Another labour difficulty confronting the Company is that of the young trained engineer being called up for

Post war: many new devices are incorporated in the new designs: electrical control often supersedes mechanical gear



have seen of this machine, yet without it our markets will wait long for new nylon stockings. Completely automatic, the former carries the stockings into the steam chamber, conditions them, exhausts itself, unseals its doors and ejects the finished product



his Military Service. Realising the importance of training their apprentices, the Company have perhaps one of the finest training schemes in the country and shortly

BUSINESS

hopes to produce a full length feature on how this works and the results it achieves.

In this respect, whilst every boy is given his chance to avoid blind-alley occupations, it is not the intention of the scheme, nor should it be with any good apprenticeship plan, to foster the belief that every apprentice will qualify for the managerial ranks of industry.

More Craftsmen Needed

Those whose bent and talents indicate that they would contribute more to industry in an executive or technical capacity, are given their opportunity, but a true proportion is maintained, so that the scheme produces men who will be trained engineering producers.

This is the type of which we stand most in need today, skilled men, and for that reason, the management give particular attention to the apprentice-side of labour recruitment.

"We have had our bottlenecks" said Mr. Backhouse, "but in almost every case we have been able to overcome them by hard work and clever thinking; by getting together designers and technicians, supervisors and operators. Sometimes we have used knife and fork methods to accomplish this end, but reconversion from war to peace is a question of getting peace time production.

"In due course we shall have a fully planned production. At the moment we are getting a fair output by improvising and expediency, but when the whole plant is streamlined again, we shall exceed in quality and in quantity, our finest prewar figure.

"It is a complex job, even more complex

than switching over from peace to war, but I think that, by the end of another six months, we shall really have attained it."

Time Savers in Purchasing

AMERICAN business men, we hear, by combining a number of forms with the purchase order set, are discovering that it is possible to eliminate several forms, to create extra records without extra writing, and to simplify the entire purchasing routine.

Inspection of several purchase order sets produced by one American company, shows that it is possible to design purchase order forms which will create, in one operation, all the records needed for "follow-up," for "receiving stock" records, for "cost" copies and for acknowledgements.

Examples of these multi-purpose forms include a card record as the final part in the purchase form, for use as a receiving record. The receiving record form is printed on the back of the card, the front being an exact copy of the purchase order, with the price column blocked out.

Another firm adds to this a copy of the purchase order for sending to the transport department, whilst another company have a time-saving form printed at the top of the final part of its purchase order form which is used to facilitate follow-up. There is a row of figures from 1 to 31, printed above 12 small boxes, which represent each month from January to December.

To create a follow-up record it is necessary only to check a month and a number, which then shows what day and month to follow the order.

BRAINS TRUST

YOUR QUESTIONS On—1 How to get good industrial press relations. 2 Attracting key men to development areas. 3 Getting more output from the rural worker. 4 Typists—an old problem; a new answer. 5 Getting back the part-timers. 6 A zoning hang-over—new sales resistance

The Press Helps Industry

1 As chairman of a well-known trade association whose members make consumer goods, I am seriously concerned: (a) at the very small amount of publicity we get in the newspapers; (b) at the adverse and uninformed criticism which we suffer in the Press.

We do not employ a Public Relations Officer but our Secretary deals with such matters. Naturally, demands upon my time make it difficult for me to see the Press often. Can the Brains Trust suggest a means of remedying this position?

MR. LEVER: Publicity of any kind these days is difficult to get, because of the limited space available in the newspapers. I would query whether he is right in being seriously concerned about the criticism.

If the Association, of which he is Chairman, has a real case, I suggest they might at least consider advertising the facts of the case, as for instance, the road transport users are employing at the present time.

MR. GILBERT: I am wondering whether I could possibly ask the Question Master for a little more information about the type of consumer goods, because I think it is rather unusual for adverse criticism to be levelled at ordinary consumer goods unless it is in comparison with foreign goods selling in the same market.

I think that in these days, if any Trade Association has a story to put across to the country, it has got to co-operate with the Press.

Surely it is in the Association's interest to make sure that, whether it is their Secretary or not, they have some-one who is publicity conscious and is prepared to give the Press every facility. There are plenty of Associations these days who get a very fair share of space in the Press, and if the Secretary and other officials of the Association maintain close contact with the Press, and if their story is a just one and an interesting one, I am convinced they will get some space in the Press.

MR. LEVER: The adverse criticism may be about the high price of their product and surely the Association has an admirable story to tell in advertising, to inform the public of the difficulties that the *bona fide* manufacturers are experiencing.

MR. GILBERT: I do think it is very important to co-operate with the Press. If these people have a hard-luck story to tell, they must tell it openly to the Press, who will probably give them due publicity and compliment the firm on what they have done in the circumstances. They certainly want somebody who performs the functions of a Public Relations Officer, and I do not think it matters whether this is carried out by the Secretary, or by someone else.

It really means getting in touch with the Press and telling them frankly and openly, what their difficulties are. If you come across any particular problems, it is often worth putting across to the Press, the four or five points which you want to stress in connection with your own industry, asking for their co-operation.

MR. LEVER: I would make the point that this is admirable when you are introducing a new product, but for current problems in established products, I recommend advertising by the Association or by certain members of it, as is, for example, now being done by certain of the photographic material manufacturers.

MR. FORD: It might be useful to have a press conference to start off your advertising campaign.

Key men turn down Jobs. Why?

2 We are a large-sized manufacturing concern in South Wales. Our tooling-up for peace-time production is being seriously hampered by our complete inability to attract and keep foremen, skilled tool-makers, and higher grade executives. We offer a man who is getting £10 a week in Slough, £20 a week to come to South Wales, and he accepts. But when he comes to visit us, he immediately turns us down because of the poor housing accommodation we can offer (probably it is only a workman's



This month's session reading from left to right: J. P. Ford, Guest Member, Question Master, E. A. Lever and F. L. Gilbert

house) and because his wife will not stand the lack of social life. How can we deal with this situation?

MR. LEVER: I am afraid this is everybody's problem today, and quite frankly there is no answer to it except a long term one on regional planning lines. There is no short term answer that I can think of to it at all.

As regards tool-making, a short-term answer might be that they try to get their tools made by specialist tool-makers in London.

In due course, as a result of more demobilisation, and with the Government encouraging the development of certain areas, we may get the results of long-term planning coming into effect. Better conditions will then grow up in these places, but this will take time.

QUESTION MASTER: The management of this firm are definitely in a spot. They want experienced executives. At first they thought they had got them. After a visit for interview, they turned the job down. They want to know why. Knowing that, they want to know how they can overcome their difficulty.

GUEST MEMBER: This state of affairs is what one would naturally expect. One can imagine the reactions of a man from London or the Home Counties. He is used to a fairly high standard of wages, plenty of amusement and good social amenities. These will no doubt be developed in the newer industrial areas of South Wales, but in the meantime the company must provide compensation for this and I don't think higher wages in itself is sufficient. They might consider a Profit Sharing Scheme or generously assisted Superannuation Schemes which would induce the applicant to take a long term view of the job.

MR. FORD: The guest member has suggested a very useful long-term policy for a superannuation scheme and a profit sharing scheme. There is, however, a shorter-term policy and that is, if it is in the company's interests, they should in some way offer some bonus or housing allowance to help to

get over this particular problem during this interim period.

GUEST MEMBER: For the executive posts they might offer contracts of at least three years, which would give stability and security over a difficult period.

QUESTION MASTER: This problem applies to a great extent to the whole form of the redistribution of industry. It is a typical example. There is going to be a redistribution of industry in the next 10 years' plans, and inducements may help to engage key men for a particular firm for that difficult period.

MR. FORD: And in the interests of the company, that is the period that matters so much. Once they are established there, others will follow.

GUEST MEMBER: I take it there is a more than average difficulty in inducing executives to go to South Wales. Without reflection on either place one would probably prefer Wigan to South Wales.

MR. LEVER: Don't let us be too sure of this. There are plenty of places in South Wales where one should not have the slightest objection to living.

GUEST MEMBER: I agree, but I was referring more to the insular mental attitude of most to these matters. After all it took a period of continued depression to induce the Welshman to seek a job in Slough.

MR. LEVER: This is a case where "Planning" (blessed word!) totally disregards human relationships. Paper planning sometimes does not take into account human problems.

MR. FORD: There is one other thing that is overlooked—probably his relations and all his friends live around Slough and you can't move your whole family down to the South Wales area, which may make him reluctant to move.

MR. LEVER: You cannot at the same time, have complete planning and immobility of labour. This is the old, old problem once more, as Beveridge himself has pointed out.

More time—More work?

3 Like many other food manufacturers, we have, with the good will of the Board of Trade, moved our factory out of London to a new model factory which we have just acquired in a Home County, and in which we employ 1,000 people.

Conditions are as near ideal as we can make them; recruitment to the industry has been relatively easy, which seems to prove our statement; we pay good wages—higher than are usually paid to local agricultural or industrial workers. But we are faced with the fact that the country worker cannot maintain the pace demanded by modern food processing equipment, as the London or Glasgow worker can.

Our output is therefore only running round 60 per cent. per man hour of the known possible which we regularly reached in London, and which we have used for costing. Our workers are most enthusiastic, but they say "Give us more time, and we will produce the output." This, however, is what we cannot do from the costing point of view, since it means adding 3—4 hours' power, heat and light costs per day in addition to necessitating the employment of a second shift for certain clerical work. It also complicates maintenance, since some of our machinery is delicate and requires constant attention. Can the Brains Trust suggest the answer?

MR. FORD: This is due to the fact that certain types of production, whether industrial or agricultural, are limited in some measure to certain areas, and it takes a long time before you get a worker in a certain area, who may be used to agricultural processes, so to change his outlook or method of working, that he can acclimatise himself entirely to a completely new set of conditions. You won't necessarily get an agricultural worker to work at the same pace as a Cockney who has been used to working under the most trying conditions on say, the production line of a small industrial component.

MR. LEVER: There is a point I would make here. I feel this question is partly self-contradictory. They complain that from a costing point of view, they cannot get the output they want.

I would suggest the product which they are making is one in which raw materials figure very highly, and the labour costs relatively speaking, may not be as important as the material content. I think that they have got to face up to the fact that their labour costs have gone up.

MR. FORD: Is Mr. Lever getting at the fact that it might be that their labour costs through being in the country, are now not so high as for their materials which had to be transported to a London district for processing?

QUESTION MASTER: I think the point Mr. Lever was making was that the labour costs

are somewhat lower through being in the country.

Take it that over all material costs are constant, the competitive margin is going to be affected by the labour costs if your labour costs are going to be higher in Glasgow or London or Liverpool, than they are in Bletchley, it is going to undermine to a great extent the profit margin of that sales product.

GUEST MEMBER: The crux of the question is how to raise the output from 60 per cent. to 100 per cent. Obviously the present margin is too wide to permit of incentive. I suggest the labour be formed into teams or groups and "learner" allowances paid for a reasonable period. If they are already paying straight time at the full rate, I fail to see how they can avoid increased labour cost, but incentive payment would be a real incentive to output and so reduce the fixed overhead element.

MR. LEVER: I think that they have also got to look at it from the management's point of view as well as from the workers' point of view. They might introduce additional mechanisation. After all, the whole problem is to consider all the time whether one can do a certain operation by hand, or whether it is cheaper to substitute a machine.

One typist each—or - - -

4 Before the war we ran a typists' pool without any trouble. It was in the charge of an experienced woman who was both good at training typists and tactful in sharing them among the executives. She also kept accurate records of time and had the typists carefully graded under three classifications.

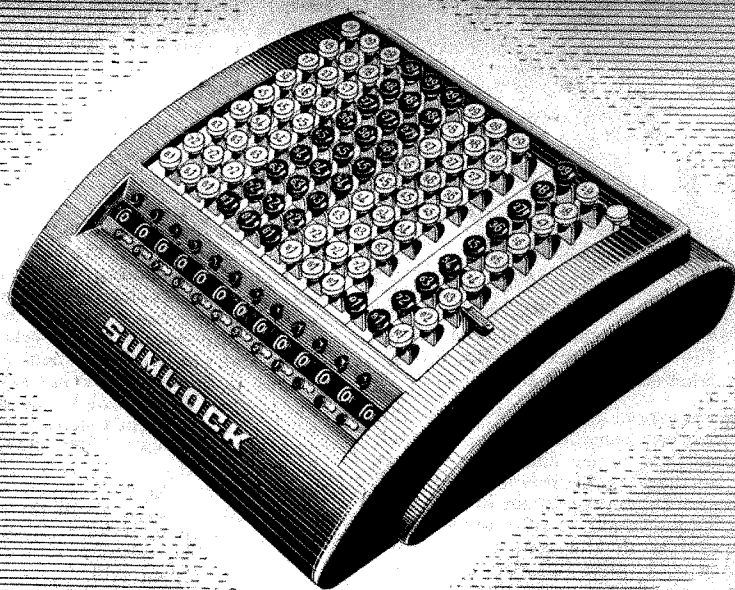
We run the same pool today under the same skilled executive, but the efficiency has simply broken down. The two new factors are (a) loss of typists, who walk out because they dislike the pool and want to work for one individual; (b) the greater irritability of the executives. Can the Brains Trust suggest a solution?

MR. FORD: I don't think that this enquiry is limited to this particular day and age.

QUESTION MASTER: It is an important problem and that is why it was chosen.

MR. FORD: I remember before the war, having just the same problem in that certain typists would not work for all, but wished to offer their services to one particular director or executive and in the same way there were many managers who would wish to have one particular typist even if that typist was in a pool or at a desk. They prefer a typist who is used to their work, but this is a problem which has to be adjusted according to each particular business.

I mean, you can separate one or two typists whom you can allot to certain leading executives. That solves the problem so far as the executive is concerned.



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Mr. LEVER asks for some background information. The Question-master must decide whether it can be given

QUESTION MASTER: Mr. Ford thinks that where a certain choice has been definitely denoted, that that choice should be at least agreed to by the supervisor and acted upon.

MR. LEVER: Of course, again in this question, there is an element of self-contradiction. If the supervisor of the pool was so good before the war, I quite fail to see how she has allowed it to break down these days.

As I have said previously, my experience of working a pool is that everything depends upon the supervisor. Unless you have the right type of supervisor, no pool will ever work. But if you have the right one, she will see that she gets a flow of new labour coming in, and I think she should be able to cope with the words termed "irritability of the executives."

GUEST MEMBER: I agree with Mr. Ford. This is not a new problem, but it is a question of degree all the time. After all every man endeavours to classify himself as a tradesman today. The general labourer has almost disappeared, shorthand typists also have become secretaries. It is natural that a secretary should want to be Queen of her own little castle, but I do think that many executives encourage this attitude by lack of patience on matters of personal service and in failure to stick to set dictation periods.

MR. FORD: There is one thing which has not been touched upon—why not use a dictating machine? Speaking from personal experience, you have got to have a certain amount of flexibility. If you have a secretary on tap to take urgent dictation, there is plenty of work which can be done on the dictaphone which can come out in the wash a little later with the rest of the work.

QUESTION MASTER: This is an interesting point. Would you confine to your dictating machine, the day's correspondence?

MR. FORD: The shorthand-typist does not want to watch you think over certain items in a lengthy letter or report, whereas there are certain items of correspondence which have got to be dealt with immediately. Somebody may ring you up and you may have to confirm that and make certain that it gets in the mail the same day. Then press

a button for the shorthand-typist, but let the general work be done on the dictaphone, and it works out quite satisfactorily. This, of course, is purely personal experience, and in other businesses it may not work.

Wartime Women Still Needed

5 We take seriously our own Ministry's pressing and urgent need, which almost amounts to an instruction, that we should get back a number of the older women who worked for us during the war. After a fortnight's serious effort, we have completely failed. Yet we can guarantee that our work is relatively clean, we work a 44-hour week, and our welfare schemes are among the best in the district. What is the answer?

MR. LEVER: What exactly do you think is meant by "a fortnight's serious effort"?

QUESTION MASTER: They have not only used the Ministry of Labour.

MR. LEVER: Do they mean to say that they have tried for a fortnight to get back their older women, if so I think they must be very impatient people. If they tried for six months and then said they couldn't do it, I would think it a serious matter. Such appeals take time to sink in.

I do not consider that a fortnight with very little result, is something to be depressed about. I think they have got to wait and hope for the best. On the other hand, we have got to face up to the fact that a lot of older people who worked during the war do not wish to work any longer.

MR. FORD: Apart from the question of whether they want to work or not, there are many husbands who have been demobilised, and their wives feel—and quite rightly—that they are going to live a family life now and let the husband go out to work. During the war years, they were content to work, but now they feel they want to get back to home life.

MR. LEVER: It seems to me that today we have had several questions which, quite frankly, do not appear to have answers. One has got to recognise that things have changed, and one must get to alter one's outlook accordingly. Some of these older people might be prepared to work afternoons only.

MR. FORD: If they won't come back for full time, they will drop out altogether, married women especially.

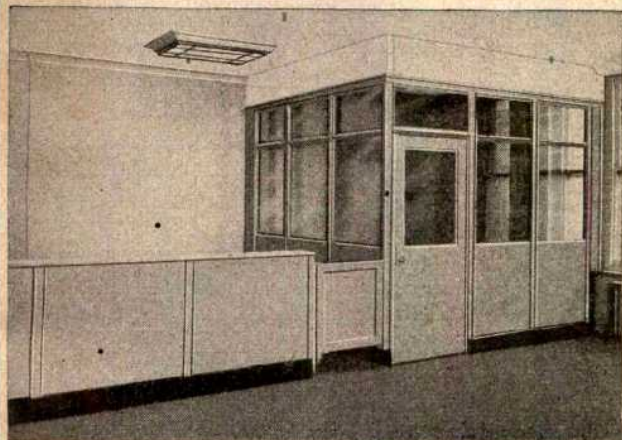
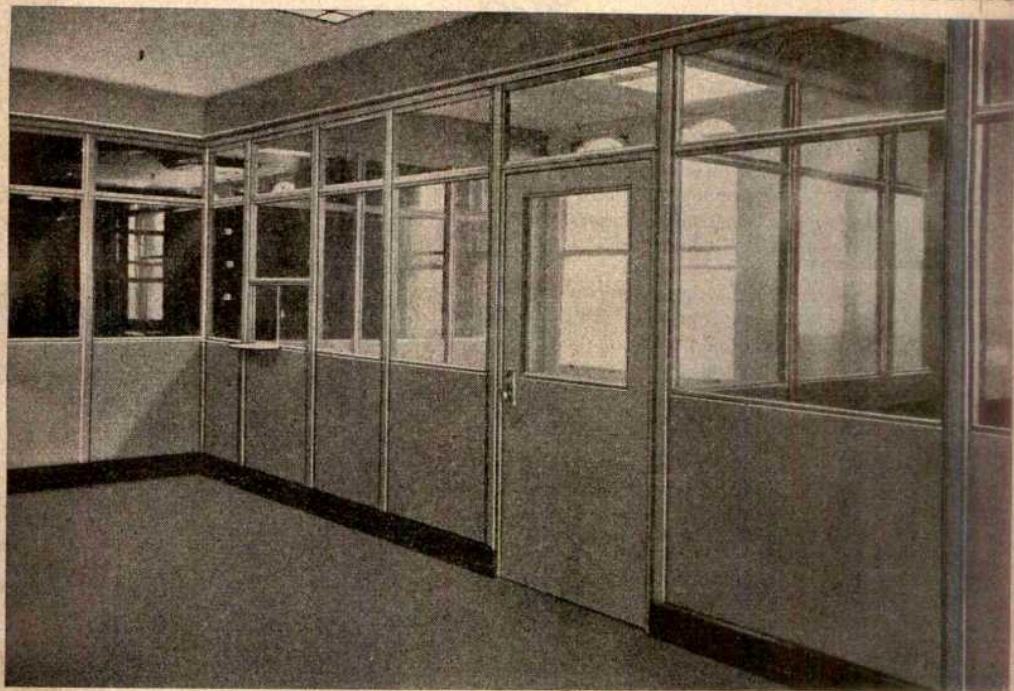
De-zoning—Renewing customers

6 The sales manager of a Midland food manufacturing organisation writes to us to say that his sales staff, with the end of zoning, are meeting a new form of sales resistance. Customer after customer in the re-opened areas are point-blank saying to the salesman, "Why should we place an order with you now when you did not call on me during the war?" The salesman's

Please turn to page 84

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What Is A Fair Day's Work

How to Measure It

FACTS

By PETER DRYDEN

(a) Time Study spotlights inefficiencies, e.g. in one firm where it was introduced, its control revealed 38% idle time which had hitherto been smeared over production. The appropriate shock administered to the progress department reduced the figure to a more normal 5%.

(b) Its application plus an incentive boosts output, e.g. 18 operators had been on day rate; after time study six operators are producing twice the output. 600% increase.

in addition we must increase those exports by 75 per cent. over the 1938 figure.

All this means that not only are we in for a gigantic production programme, but that due regard must be paid to the economics of trade so that goods are not only made available for export, but that they will be offered abroad at competitive prices without subsidies.

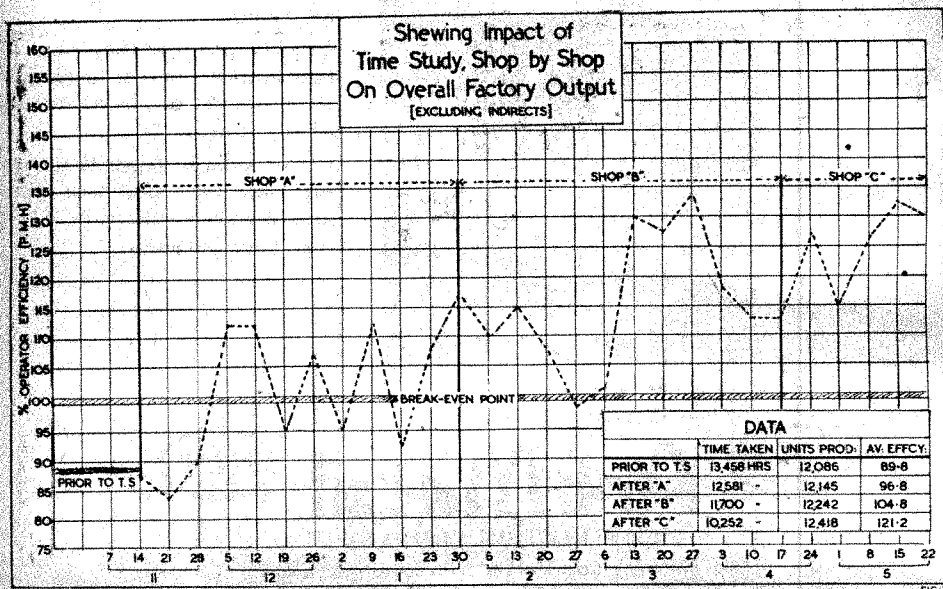
It is simple economics to quote that if the home market can be stimulated, overheads will be spread more equitably and thus bring down the price to the overseas consumer. Yet, if prices remain high in this country, wages must follow suit.

This prejudices costs. It is therefore imperative that costs come down; at the same time it is an industrial necessity that wages remain high to absorb home markets and to provide a taxation yield equal to our commitments.

How then to reconcile high wages with low costs? That is the point about time study. Time study is a yardstick of efficiency. It points the way to establishing what is a fair day's work. It is plain common sense, unadorned by any philosophical jargon to state that economic stability is based on an adequate labour return for wages paid. Wages can be as high as political expediency

THAT time study is a tool of management, no serious thinker will deny; that it can be applied to every type of work, whether manufacturing, commercial or just plain factoring is a lesson that industry has yet to learn. Consider, there are 245,000 firms listed as factories in this country. Less than 5 per cent. of them employ time study as a means of labour measurement and output control.

We in this post-war era, are now faced with a tremendous task, that of rebuilding this country's towns, rehabilitating its industries and recouping its export trade and



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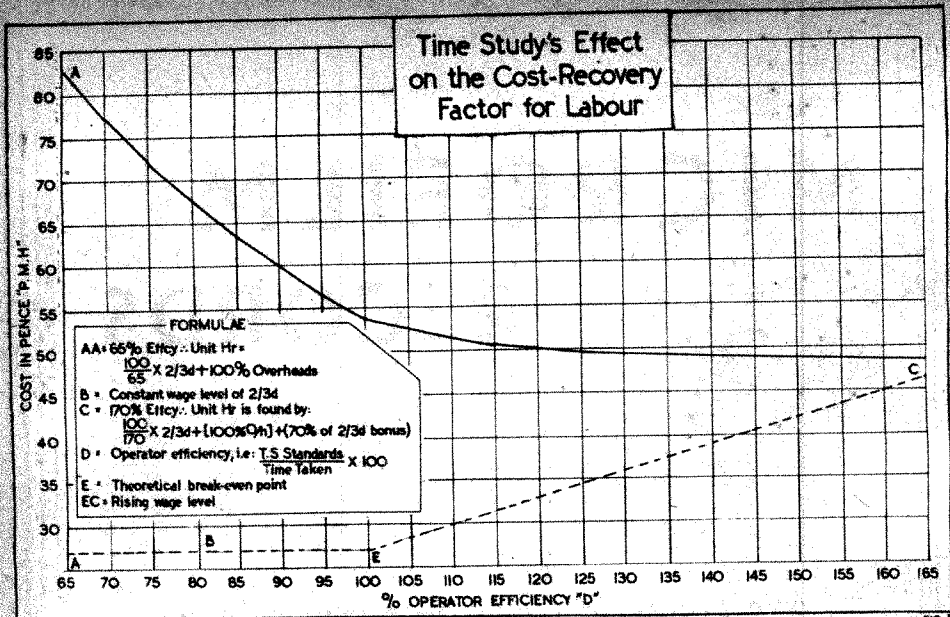


FIG. 1

demands, providing always that output for those wages is proportionately high.

From the point of view of the worker it is unreasonable to expect an improvement in output for the same money; this then presupposes some reward for the extra effort involved.

From the viewpoint of management it is impossible to expect a sudden rise in efficiency unless there is an adequacy of working tools. Time study provides one answer to these two facets.

As a measuring instrument, it supplies the answer as to how much output should be forthcoming per hour for the wage rate operating in any particular industry; it also conduces a form of efficiency-effective performance obtaining in the organisation, department by department.

Human nature being what it is, it is natural that as the hope of reward sweetens labour, so it is the best incentive that offers a reward commensurate with the amount of labour, skill and application that is required for the efficient performance of the work task.

Of course it is not an essential requirement for time study that it is backed by an incentive. This helps, but in a number of cases high wages alone can be offered providing always that the work is measured and thus ensuring that the high wages are justified.

Certainly in those industries where high wages are being paid *without any guarantee of output*, friction is almost certain to result from the application of a measured output, but with the promise of the relaxation of the E.W.O. this point will doubtless solve its own problem.

Where time study is not in use, it is impossible to tell exactly how much work-expectation should be returned for the wages

paid; in other words, the organisation knows what its labour is costing by an examination of the pay roll, but is never in the position of being able to decide exactly how much it *should* cost.

Further, except by a complicated process of work division, no exact cost allocation per product can be arrived at; at the best it is an average figure, at the worst a pure guess.

Once time study is accepted in a works organisation, proper control can be maintained over the labour utilisation, idle time is reduced to a minimum, machine loading becomes more exact, shop efficiencies lend themselves to proper appraisalment, budgetary control becomes a feasible proposition and finally, the whole tempo of the organisation quickens.

Time study is, then, a process that:

- Projects a critical survey to discover the one best way, not only of manufacturing methods, but of layout, paper work, progress and planning;
- Determines a qualitative and quantitative return for basic wages paid;
- Converts production figures to common denominator and therefore permits a scrutiny to be made of the various departmental efficiencies.

In Fig. 1 will be seen the increase in production efficiency arising from time study plus an incentive.

Fig. 2 shows the same efficiencies plotted against the overheads and the remarkable fall is due to two factors. Firstly, the wages bill is lowered and secondly the output per wages bill is increased.

The relationship between the cost of the labour under the old system and the cost of the new (plus the payment of bonus), is

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Five SHORT CUTS to Office Efficiency

Communications Officer

ONE office manager, we learn, in these days of postal communications difficulties, has appointed a senior male clerk for the post of communications officer. Telegrams and other wire messages can be sent in so many different ways that the average clerk hardly knows the best method of sending each message. The communications officer idea aims at ensuring every message going via the best method. He makes the decision, asking each executive responsible for sending a telegram, to state the urgency situation.

Then the telephone clerk in the communications department, consults previously prepared information showing the best method of transmission. Sometimes these days a telegram is quicker than a phone call.

Special Phone No. for Job Seekers

WHEN advertising for office help the process of handling telephone calls from applicants is speeded by a special telephone number which does not necessitate calls being cleared through the company's switchboard. It relieves congestion on the board, insures applicants getting to the right person, and generally speeds up the handling of all enquiries.

The plan makes it possible to give short interviews to all applicants who call, and assists in screening out potential employees from impossible applicants. Inviting applicants to telephone for appointments also tends to increase the number of applications received.

"Business" takes its Own Medicine

MANY a time before today, we have written in these columns of the importance of lighting, not only in the factory but in the office. It is a major factor in office output. With supplies easier, and priorities not so hard as they were, our own management has just completed the total re-lighting of the whole of the Business Publications Organisation.

Previously, many executives had their desks individually lit by desk lamps in addition to the general lighting in their rooms. Desk lamps have now been discarded and a soft, bright lighting system replaces them. There is a general feeling of satisfaction throughout the whole organisation and al-

ready noticeable effects are being observed. It definitely has helped output and production in our own case.

Perhaps lighting is number one on the agenda of many office managers. It is only in relatively few offices that the lighting system is complete.

A paint company reports that one firm which had been complaining about lights, had the whole place redecorated, and discovered that a carefully planned painting job increased lighting by 225 per cent. We believe, we too, are due for a thorough spring clean, including a planned painting system.

Paste—Not Pins

DESPITE all our planning, certain documents are still pinned today in eight out of ten offices. The pinning or clipping of papers is a problem, for few clerks can pin them so that anything but the top sheet can be read without unpinning.

It is simple, with a little care, to see that the pinning is done right in the first place, and this will save a considerable amount of time when papers have to be examined and re-examined a dozen times a day. In many cases a simple pasting operation saves much time and many pins. It is reported in one instance, that it saved 25 per cent. of the time of several clerks.

Methods Stocktaking Needed

DECLARING that many office forms, methods and procedures were set up to satisfy government requirements, or for other wartime reasons, a prominent office manager says that every office manager needs to conduct a thorough stocktaking of all procedures, forms and methods in use with a view towards eliminating all those which may have become obsolete with ending of wartime contracts, controls and government supervision.

"Many office routines can now be simplified with a consequent saving of materials, time, labour and expense," he declares. "Unless an over-all study is made covering every office operation, some office managers are going to be embarrassed months later to find that certain jobs are still being carried on to satisfy the 'one big customer' whose contracts have been cancelled some time ago."

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This System Handled Increased Turnover and Solved Staff Problem

By G. L. WIDDOWSON

HOW to handle increasing business without employing extra staff or mechanical devices was the problem which faced Messrs. Dean & Noble, Ltd., Hyde, Manchester, some years ago.

The system they adopted to cope with the increasing business is still yielding such excellent results that a description of it may interest the many small and medium sized firms which feel the need for more modern accounting and record-keeping methods. Moreover, the system adopted could readily be converted to complete mechanisation at a later date.

The Company are Electrical Engineers with specialized departments for Exide Battery Service Station, Electrical Contracting, Wireless and Lucas Auto Service Station. The business is conducted through the medium of two shops, at the back of which there are extensive workshops. There is a staff of about 35, 10 inside and 25 outside.

Formerly, bound Order and Sales Books were used, and at the end of each month it was necessary to go through these to collect the information for invoicing. These methods worked well enough in the early days of the business, but when the turnover started to increase the work of invoicing was frequently spread over half of the following month. Under the system now in use, all invoices are despatched on the first day of the month.

Repair work was handled by means of unnumbered Job Sheets, with no cross-check, and it was often difficult to know if a job had been done and if completed jobs had been invoiced.

The new methods adopted can be grouped under four main headings: 1. Control of Stock; 2. Control of Repairs; 3. Invoicing; 4. Accounts.

Control of Stock

It was recognised that a careful check on stock was as important as a check on cash; in fact, as conditions have developed, with goods scarce and cash plentiful, one might say that the control of stock called for even more attention.

Now a separate record sheet for each article is kept; the sheet has columns for Date, Received, Issued, Delivery Note number, Balance on Hand. To facilitate reference, each class of stock is recorded on paper of a different colour, viz.: *Yellow* for High

Tension Batteries, *White* for Low Tension Batteries, *Blue* for Torch Batteries, *Pink* for Bulbs. The individual record sheets, size 5 in. x 9 in., are housed in a Visible Binder, fitted with multiple posts and rapid release mechanism, which permits of the speedy removal or insertion of sheets from or at any given position.

The sheets are "staggered" on the posts in such a fashion that each one extends $\frac{1}{2}$ in. below the one above, thus giving a "visible" edge. This visible portion serves to identify each sheet and shows the name of the article and stock number. There are 25 names to view in each tier, and the tiers are self-indexing by dividing sheets with projecting tabs bearing appropriate titles.

Thus immediate reference is given to any record by first turning over the Index Sheet and then casting the eye down the tier of sheets. All Receipts and Issues are added to or deducted from the last balance, and the new balance extended, so that the storekeeper can always see at a glance the current stock position of any item. Coloured metal Signals are fixed to the sheets to indicate when the stock is getting low.

Van Stock. Linked with the main stock control is the record of Van Stock sales and replacements. The vanmen on their delivery rounds carry supplies of stock goods for sale. Each vanman is provided with a small loose-leaf stock book containing coloured sheets; this is, in effect, a miniature of the main stock record.

The storekeeper enters the issues on his own records and on the corresponding sheets in the vanmen's books. When a vanman makes a sale, he gives the buyer a numbered Delivery Note (retaining a copy for the office), and enters the sale on the appropriate stock sheet with Delivery Note number.

At the end of the day the storekeeper can check sales by the stock sheets, copy Delivery Notes and the actual stock left in the van.

When a vanman wishes replacements of stock, he fills in a sheet headed "Van Stock Replacements" and printed with code names for all saleable items. The storekeeper prepares the replacement stock for issue to the vanmen in the morning and makes the necessary entries on his own stock records and on those of the vanmen.

Any items not in stock are shown in a special section at the foot of the "Van Stock

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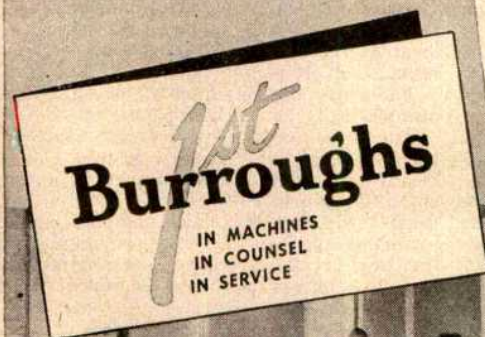
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How to Get More from Salesmen In Training

Co-operation and Confidence will get Results

By R. M. COOPER, A.I.A.A.

IN January BUSINESS, the possibility of sales training, and the profitable utilisation of the trainee's time in the factory or office was suggested, particularly in connection with demobilised men.

It is now proposed that we examine the question in greater detail, and see how the matter can be effected.

We plan to achieve:

1. The readjustment of the man to civilian employment.
2. His greater knowledge of the company's products and of procedure.
3. The raising of the general interest and morale of the inside people with whom he comes in contact.
4. The utilisation of the man in work which, whilst educative, is also productive, and to avoid the feeling of delay and frustration, which often occurs during training periods.

In the Services, he has had to conform to the book of rules for a very high percentage of his time; that time, too, has been planned for him. As a salesman, he must do most of the planning of his time himself, conforming to company policy briefed from time to time by the sales manager. He must retain his morale and keep cheerful under his own steam in difficult times.

Fostering Confidence

For the purpose of this article, let us assume that the workers in the factory have lost some of their interest in their work. P.M.H. is not what it should be, a tiredness has crept in. The office staff also suffers, at least the juniors, from a similar complaint. On the whole, not a very happy condition into which to be introduced.

Let the situation be faced at the start. Tell him of the condition, ask him to help in removing it, build up his confidence in the company and its products, be sure that he believes in the management, convince him of the importance of the task you are giving him. The ex-officer particularly will respond well and co-operate.

In some factories, it will be advisable to bring the shop stewards into the scheme; their co-operation is most important. Get them to help him to know what he needs to know. If salesmen do not sell, shop

stewards' difficulties will be greater, and greater, too, will be those of their flock, when competition returns.

It must now be decided where the trainee is to commence. If some methods or processes are secret it may be desirable to adjust the progression to avoid some sections of the works, but the maximum freedom is preferable.

First, let him go into the works offices, or foremen's writing points, to assist with the records which have to be made there, co-operating with the foremen and clerks to get details correctly entered and passed on for appropriate action elsewhere. If he is first asked to check the legibility of figures on forms already completed, he will soon get an idea of what is required. When subsequently making entries himself, the regular clerk should check them. After a short period this should result in a little spare time for the clerk, who would be able to answer questions about work going on in the shop, and education proceeds.

The Round of Introduction

The trainee should be moved from writing point to writing point, and within a very short time would be able to provide a first reserve should a clerk be absent for a day or two.

He should then be put into the stores department, first as a runner (he now knows the factory layout) then to assist with the records, but all his work must be checked by the man responsible. It takes less time to check than make the original entry.

He now needs to be moved closer to the works manager, and should be used to assist in the work proceeding in his control office, compiling records and assisting towards efficiency. By this time, he should have quite a useful knowledge of works methods, difficulties that have to be overcome, reasons why things must be done in certain ways and not in others.

A short time could now be allocated to sales accounts department, where he could see the work involved in dealing with customers' accounts, and the care needed to avoid bad debts. The accountant, or cashier, should supervise his passage through accounts to ensure only permissible information is obtained by our trainee. There will probably

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be a number of jobs which he can do, however, which will relieve pressure on the regular staff.

From accounts department he should proceed to the sales office, and would probably be able to deal with a certain amount of correspondence and come directly under his immediate chief, the sales manager, who would direct his further training. He could be sent out after a suitable period in this office, on any special calls which require a salesman, until such time as a territory is available for him.

Meantime, it is suggested that, wherever a weakness occurs in the organisation, due to a temporary absence of a clerk, or the over-loading of a department, he is allocated to bolster up and assist in removing the weakness.

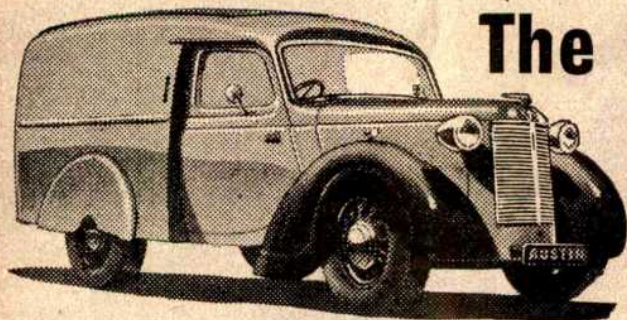
It should be appreciated that this method of sales training can only be effective if applied with imagination, and utilising trainees of a high degree of intelligence. It should, at the same time, prove a useful testing period during which both management and trainee become acquainted, and have an understanding of each others' capabilities. It enables the right type of man to be obtained and held where the supply and labour position is not good but improving, and assures that a man is available who knows the company's product, as soon as the position warrants the appointment.

Each week a talk, followed by a discussion, should be given to the trainee by a senior executive of the company. If more than one can be arranged, and after factory hours, all the better. It means another call on the time of busy men, but this need not be great if a proper rota is arranged, indeed the profit can be mutual for fresh minds usually mean a new viewpoint, and the man likely to make a good salesman will think constructively.

Training Time Varies

It is impossible to provide more than an outline for thought in this article. The special conditions obtaining in each organisation, and the personalities operating therein, necessitate an individual plan suitable to each individual concern, but in every case the plan should be flexible. The human factor is the first consideration, and the whole basis of the idea is to utilise the natural salesman's cheerful friendliness, initiative, inquisitiveness and desire to help.

The training period may be two months, or it may be six, according to conditions, mainly of supply, and accommodation for the man will probably have to be found locally. Arrangements could probably be made, with the aid of the company's notice board, for residence with some of the employees.



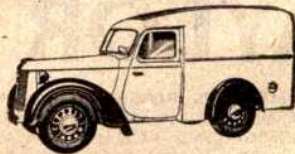
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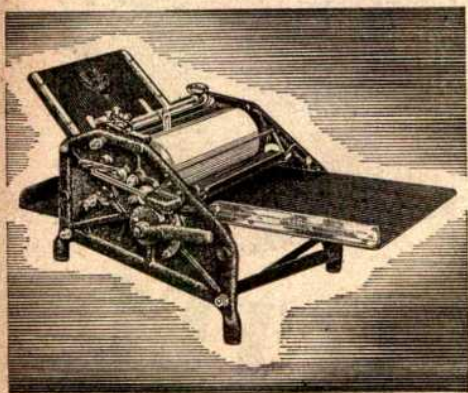
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IN CIVIL LIFE AGAIN



For five years we have made Banda Duplicators for the Forces. Now we are able to supply once more for the needs of industry. In hundreds of offices throughout Britain, the Banda is working smoothly, efficiently, producing short runs of all types of office and internal forms, stock lists, price lists, memos, sketches and diagrams.

NO INK—NO STENCILS—NO GELATINE

Is there a "Banda" in your office?—if not phone or write to Dept. B.

BLOCK & ANDERSON LTD
PIONEERS OF SPIRIT DUPLICATING

Head Office: Victoria House, Southampton Row, W.C.1
Tel.: Chancery 6288

Works: "The Beeches," Trumpington Road, Cambridge. Tel.: Trumpington 305 (3 lines)

Branches at: Belfast, Birmingham, Bristol, Cardiff, Glasgow, Liverpool, Manchester, Newcastle, Nottingham, Sheffield, Southampton



REGD. TRADE MARK

Sole Agents for the Eastern Counties:

S. R. Batson Ltd., Ipswich, Norwich and Chelmsford

Government Assists New Industry

BRITISH exports rose sharply in January, but the level of imports has also risen and the adverse balance of trade for the month was £34,800,000. Continued intensive efforts in the export drive are therefore required from everybody if the target of an increase of 75 per cent. over the country's pre-war export trade is to be achieved.

Happily, there are signs that the industrialists of this country are rising to the need of the hour. For instance a visit to the offices of BETRO gives hope that that body, whose activities have for some months been shrouded in mystery, is coming to life. The Principal Director (Mr. A. Ethell), has added three key men to his staff. Offices are being opened in Stockholm, Johannesburg, Cairo, New York, Buenos Aires, Toronto, Bombay, Calcutta, Sydney, Melbourne, and Auckland. The organisation is shortly to make a drive for membership. This last point is as significant as any, in so far as it indicates that BETRO is able to give service, whereas until now it has been in the formative stage.

The new appointments are as follows: Director of Research, Mr. A. G. Jones; Director of Contacts, Mr. S. L. Lewis; Director of Administration, Mr. H. A. P. Disney. During the war Mr. Jones carried out social surveys for the Ministry of Food, Mr. Lewis was a Colonel in charge of organisation and methods at the War Office, and Mr. Disney was a Group Captain in the R.A.F. and was responsible for subjects connected with the organisation and planning of equipment. Mr. Ethell himself, who replaced Mr. Philip Scott last July, was adviser on organisation to the Air Ministry. He was also in India for a time, as adviser on organisation to the Government of Bengal.

Room to Develop

IN February of this year, I threw a brickbat at the government for their apparent lethargy in dealing with manpower and licensing problems. Here, for a change, is a bouquet.

By the time this issue appears, a new basic industry will have been established in South Wales. Under the Distribution of Industries Act of 1945 a huge block of factories, comprising the greater part of a Royal Ordnance factory, has been allocated for the manufacture of a new range of waxes which in their importance have been compared with rayon and plastics. It was only last autumn that the experimental production of the waxes was announced, so the prompt allocation of



"HARVEY"

Adjustable Steel Storage Equipment

"HARVEY" Adjustable Steel Storage Bins and Shelving can be arranged to form stacks giving accommodation for small or large quantities exactly as required. NO WASTE SPACE.

"HARVEY" Steel Equipment is portable, it can be dismantled and re-erected by unskilled labour without any depreciation whatever. NO fixing to floor or ceiling is necessary.

G.A. HARVEY & Co. (LONDON) LTD WOOLWICH RD LONDON S.E.7

ANNOUNCEMENT

"MUSIC WHILE YOU WORK"

Notice is hereby given that the expiration on February 24th, 1946, of the Wartime Licence-Agreement between H.M. Government and this Company will involve the issue of individual Licences by the Company to authorise, subsequent to that date, the performances on Factory premises by means of Gramophone Records which were previously covered by the Government Wartime Licence Agreement. A special tariff governing all such performances is given below.

SPECIAL TARIFF FOR FACTORY AND INDUSTRIAL PREMISES

1 For the use without limitation of records in factory and industrial premises including Canteens, Sports and Social Clubs within the sole control of the Licensees:—

An annual fee calculated at the rate of 3d. per annum per employee employed in those parts of the factories or industrial premises where musical entertainment is provided, with a minimum annual fee of £3/3/-.

2 For the use without limitation of records either solely in Canteens or in Canteens and Sports and Social Clubs within the sole control of the Licensees (but excluding such use in Factory and Industrial premises):—

An annual fee calculated at the rate of 3d. per employee and based upon the average number of employees using the Canteens daily.

3 For the use without limitation of records solely in Sports and Social Clubs within the sole control of the Licensees (but excluding such use in Factory and industrial premises and Canteens).

The standard tariff (obtainable on application) as applying to Sports and Social Clubs.

4 Licences issued under tariffs (2) or (3) above do not permit the rediffusion of records by radio in any parts of the premises within the control of the Licensees other than those to which such Licences apply, and in respect of such rediffusion an additional fee of £1/1/- per annum will be payable.

Applications for Licences should be made on the appropriate form which will be supplied upon request. Pending the issue of the requisite new Licences, which will be made effective as from February 25th, 1946, permission is hereby given for the continued use of our Members' records as formerly.

PHONOGRAPHIC PERFORMANCE LTD.

144 WIGMORE STREET, LONDON, W.1

such a big area of factory space is a tribute to the value attached to this youngest of Britain's post-war industries.

Needless to say, there are a good many reasons behind what might otherwise appear to be rather speculative action on the part of a Government Department. Not only will the re-opening of the South Wales factories bring employment to a former depressed area, but the industry will be of considerable value to British export trade. The waxes in question have numerous important advantages over natural wax, and are of use in the manufacture of many commodities—polishes, paints, wallpapers, radios, gramophone records and cosmetics, to name only a few of them. It is hardly surprising, therefore, that the makers of the new substance have already received orders from the U.S.A., Canada, Sweden, Denmark, Norway, Switzerland, Belgium and France. However the most encouraging aspect of the whole enterprise is the implication that the Government are putting into practice speedily their declared policy of encouraging new industries in Britain.

Help for Direct Mail

THE relaxation of some of the restrictions on direct mail advertising give special point to the remarks of Mrs. Isabel Banay in her address entitled "On the Receiving End of Direct Mail," delivered at a recent

B.D.M.A.A. luncheon. Mrs. Banay gave direct mail advertisers five "danger don'ts"

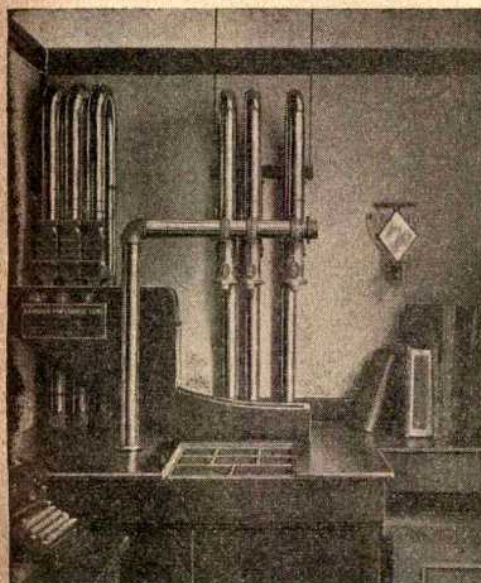
—(1) Don't reduce the quality of your advertising matter when the circulation grows; (2) Don't lose sight of the fact that it is a real, live *person* you are addressing; (3) Don't lose your prospect for want of an adequate follow-up to your first mail-piece; (4) Don't ignore style and colour dynamics in the most important part of the mail—the envelope; (5) Don't omit to work out exactly what a single mailing or a whole campaign is intended to do.

Good Work Gloucester

AFTER several months' negotiation and design work, and in face of keen international competition, a firm of hydraulic engineers in Gloucester have secured a quarter of a million pound order for axle and tyre equipment for the Argentine State Railways. The plant involved constitutes a complete lay-out for the tyre and axle manufacturing works at Cordova, and includes high power hydraulic presses, accumulators, and pumps, together with the necessary ancillary machinery.

This is only one of a number of big export orders now in course of execution by the company. Since D-Day, it has received and delivered three quarters of a million pounds' worth of orders.

SPEED . . . SECRECY . . . SECURITY



That's the Meaning of

LAMSON SERVICE

Wherever they are installed, LAMSON Despatch Tubes ensure the safe and speedy carriage of cash and documents. The illustration shows a typical three-tube installation at Spaldings Ltd., Cheapside. "LAMSON SERVICE" is available to the smallest office and the biggest store.

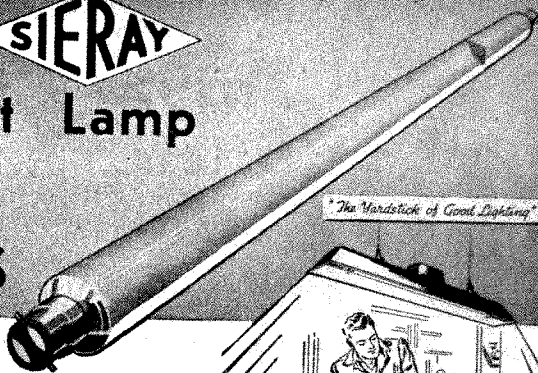
Write now for details.

LAMSON

ENGINEERING CO., LTD. WILLESDEN, N.W. 10.

Telephone: LAD. 8424
Telegrams: KILFME, HALLS, LONDON

This 5ft. **SIERAY**
Fluorescent Lamp
uses only
80 WATTS



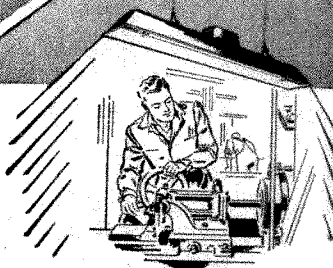
"The Yardstick of Good Lighting"

Five feet of brilliant, glare-free light — yet this SIERAY FLUORESCENT LAMP uses only 80 watts — equal approx. to THREE 75 watt gas-filled lamps! And this advantage applies both to Sieray DAYLIGHT and to the softer, sunnier WARM WHITE lamp.

This most modern light source, which by virtue of its size casts little shadow, enables workers to see what they are doing without effort. The result is increased efficiency and output.

Siemens Lighting Engineers are at your service, to advise, without obligation, Call them in or, if you prefer it, write first for descriptive leaflet.

Siemens Electric Lamps & Supplies Ltd., 38/39 Upper Thames St., London, E.C.4



**NOW
AVAILABLE—
SIERAY**
40 WATT 4 ft.
Fluorescent Lamp
Write for details

Made throughout at SIEMENS
Lamp Works, Preston, Lancs.

"BROUGHTON
Security"
FOOT GUARDS

PROV. PATENT No. 8867/44



★ Interchangeable
between workers

★ No "lefts" and "rights"

★ Completely protects
the toes

★ Light and comfortable to wear

★ Protects footwear

★ Easily fitted
and removed

★ Low Cost

★ No Coupons!

Further details on application

J. BROUGHTON
INDUSTRIAL SAFETY ENGINEERS

"SECURITY" WORKS, VERE STREET, BIRMINGHAM, 5. Phone: MIDland 5901-2-3



Turn back the Clock

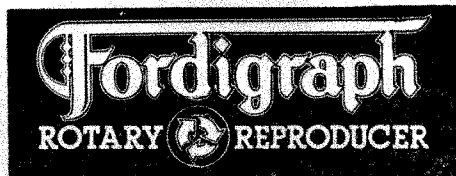
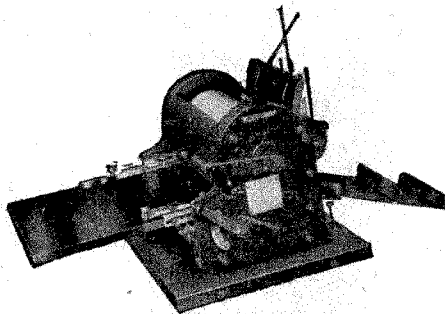
BUT you won't recover lost hours that way.

For real time-saving you must have a **Fordigraph**. The machine that reproduces in several colours at once on varying thickness of paper.

Save time by eliminating stencils and setting-up; by changing the original in three seconds; by getting clean, dry copies ready for folding.

Delight in the hairline registration; the immediate readiness for use; the general ease in operation.

But it must be a **Fordigraph**. Write to-day for full details of the machine you can't do without.



FRANK R. FORD LIMITED,
FORDI HOUSE - GRANTHAM ROAD
SPARKBROOK - BIRMINGHAM, 11

And at London and Manchester.

Executives' BRAINS TRUST

Continued from page 64

answer, of course, is that the zoning closed down his connections, but it seems that new relations have grown up between retailers and new suppliers during the zoning period.

How would the Brains Trust set about breaking down this sales resistance?

GUEST MEMBER: My personal experience on this a couple of weeks ago from a relative of mine is that he told me that although de-zoning is taking place, there are no increased supplies and so therefore he is now being contacted by pre-war sales representatives who say: "I can consider business with you but what guarantee can you give me on supplies?"

The answer is that he cannot give any guarantee because although they have been de-zoned they are not getting increased supplies from the factory and so are now trying to spread their total allocation over a wider area. There are no more biscuits for the home market than there were before de-zoning, and so a person who has received none for the past four years is still unlikely to benefit.

MR. LEVER: It does seem to me that this is a transitional period question, and it will be fully answered or alternatively will not arise when there is freedom of supplies.

After all, if this firm is one that is making an old-established, well-known article, as perhaps it is, there is no question that the grocers up and down the country must stock up because they will be asked for it. Today one cannot get, say, the sauces one particularly likes, but I am sure the time will arise when people will insist on getting, say, Worcester Sauce because they like it.

GUEST MEMBER: I was discussing this question a couple of weeks ago with a relative in the food business, and it would appear that although de-zoning is taking place and Sales representatives are back on their old territories, there has been no increase in supplies. The allocation is therefore now being spread over a wider area. The reaction of the buyer to this must be unfavourable as he is now being asked to split his order and his customers will still get nothing more in total supplies than they have had for the last four years.

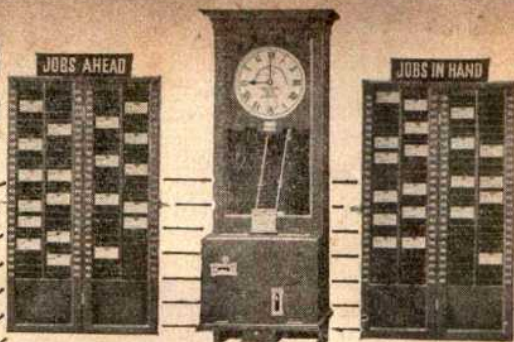
QUESTION MASTER: What effect is that going to have on firms advertising? The man who asked this question was before the war, a national advertiser.

MR. LEVER: When he is in a position to supply, national advertising will be almost the complete answer to the point.

QUESTION MASTER: So the answer really is that when supplies become more plentiful, then the resistance will be broken down by adequate national advertising and assuring the retailer that his supplies are going to be available.

MR. LEVER: The question will answer itself in due course.

SUPER SERVICE



These special points have established for the "G.B. Clipper" Job Costing superiority of service beyond question.

- NO SHIFT LEVER
- NO SPECIAL MEALTIME SETTING
- NO OVERSTAMPING
- NO RECORDING ERRORS
- NO WINDING (ELECTRIC MODEL)
- NO DATING OF CARDS BY HAND
- AUTOMATIC CARD MOVEMENT

At each clocking the "CLIPPER" accurately locates the card for the next occasion irrespective of time signal. This unique feature means maximum efficiency with convenience and a definite saving of time and labour.

GLEDHILL-BROOK

TIME RECORDERS
AND JOB COSTERS

Over 36 years specialised experience and study at your service.
GLEDHILL-BROOK TIME RECORDERS LTD., Dept. 38, EMPIRE WORKS, HUDDERSFIELD.



ASK *Will Stormor*

TO PLAN
YOUR STORAGE.

STORAGE SOLUTIONS

No12



Before being "STORMORISED" this store was "Choc-a-block"—now the customer says "The storage accommodation has been increased by 60% to 70% and its layout, orderliness and efficiency improved beyond belief."

Why not write for particulars.

If you have a storage problem—either to gain space or accommodate more storage consult Will Stormor without obligation.

STORMOR

MOBILE STORAGE UNITS

British Patent Nos.
470756, 471323, 484542,
493198 (others pending)
and over 80
World Patents and
Protections.

GLOVER & SONS LTD., 42/46 Groton Road, London, S.W. 18.

Phone: BATTERSEA 6511

EFFICIENCY AUDIT

Continued from page 36.

system and those whose job it will be to work it; and, finally, results all too frequently in more systematisation. This inevitably leads to increased overheads. Conversely, as overheads rise, efficiency is shown to decrease.

"Ergo, the firm adopting this practice has unwittingly defeated its end, for it set out to secure greater efficiency, but ended up on the wrong side of the balance sheet. The same applies to methods, and changes of methods.

"There is only one way in attempting to get an idea as to how the best managed concerns achieve a high efficiency, and that is to examine their methods of management, their technique of production, and from your observations make a note of the best. But whilst doing so bear in mind that what might be best in the set-up under examination might not be so suitable if transplanted to yours.

"The expert in management can learn from such observations and his experiences can tell him the experimental modifications he

needs to institute so that he can arrive at the best method, calculated to increase efficiency in his own plant. It all boils down to this, that to achieve as high a level of industrial efficiency every opportunity must be taken of examining different businesses and taking those bits that are like your own and using them as a yardstick.

"In this way, whilst you may seek in vain for a factual efficiency audit, the attempt to make an efficiency audit is an education to the top management undertaking the task. When you have learned and applied the experiences you have gained, the chances are that a gradual improvement in the efficiency of your organisation is becoming perceptible.

"You have grown in wisdom, you have added value to your management's technique. Figures disclose concrete evidence that the new ideas are profitable, and you can then perhaps be said to have carried out an efficiency audit. You know something by that time that makes your plant better than its competitors. You may indeed have produced a technique for carrying out an efficiency audit.

"But suppose that you have, would you disclose what you have discovered to a third competitive party?"



Less files, more space

If your files of documents are occupying valuable space, you can of course move them to space which is less valuable — but they will then be less conveniently located. You save valuable space but lose valuable time.

An ideal compromise may well be to remove the bulky documents to some more or less distant point, and keep at hand, for immediate reference, micro-photographic records. With a viewer the micro-copies can be found and read as easily as if they were the original documents.

Space saving is only one of the advantages of micro-photographic recording. Full details of this modern system from :—

RECORDAK DIVISION OF KODAK LTD.

DEPT. 19, ADELAIDE HOUSE, KING WILLIAM STREET, LONDON, E.C.4 and at 11 PETER STREET, MANCHESTER



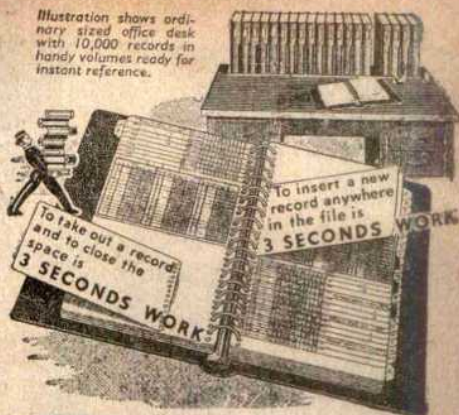
MEN WHO PLAN
FOR TOMORROW
choose

**UTILICON
PULP PACKS**

... because these modern containers are
moulded to protect valuable products ...
are light ... strong ... and have definite
sales appeal.

UNIVERSAL PULP CONTAINERS LTD
MILTON OF CAMPSIE near GLASGOW

Illustration shows ordinary sized office desk with 10,000 records in handy volumes ready for instant reference.



Twinlock VISIBLE RECORD SYSTEMS

For all those systems where instant reference is of paramount importance—wherever changing data needs recording—where vital facts must stand out from all others—where thousands of items must be compressed into a small space—Twinlock Visible Record systems will give you 100% efficiency.

May we call and show you how Visible systems will help you?

You can help yourself to our services and experience in three ways:—

A. Ask your stationer or printer to show you our line.

B. Write to us direct to come and see you.

C. Visit our showrooms.

Twinlock METAL SIGNALS

Vital facts cannot be overlooked—these coloured signals announce themselves.

IF IT'S LOOSE LEAF
THINK OF

Twinlock

PERCY JONES (Twinlock) LTD.
37, CHANCERY LANE, LONDON, W.C.2.

Showrooms: London
Chancery 8971

Glasgow
20 Renfrew Street
Douglas 4974

Manchester
17, Chapel Walks, Cross Street
Blackfriars 9459

Leeds
69, Albion Street
Leeds 15972

SPORT IS BIG BUSINESS

Continued from page 53



"Should we agree to their terms?"

PROFESSIONAL and business men have a point in common; they frequently need to make swift decisions which must be based on the most accurate information. To do this effectively, immediate speaking contact between executives and staff, with facility for documents, files and other information to be consulted whilst conversations are in progress, is a necessity. A.T.M. Inter-communication Telephones provide this service to perfection and are obtainable for a very moderate rental charge. Write or telephone our nearest branch for details and rates.



INTER-COMMUNICATION
TELEPHONES
OBTAINABLE ON RENTAL

AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.
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Main Branches:—Manchester, Leeds, Birmingham, Bristol, Glasgow,
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Edinburgh, Gloucester, Ipswich, Middlesbrough, Newcastle-on-Tyne,
Nottingham, Plymouth, Rhyl, Sheffield, Southampton, Stoke-on-Trent and
Swansea.

A1202/3-CVT

Now, however, future programmes are being planned and the aim is to increase activities as post-war conditions permit. The sixty members of the staff who joined the Services all came through safely and most of them are back again in an organisation where changes are few, working conditions good and their employer exacting but just (because he knows every man's job). Once again Elvin is saying "You're in the entertainment world" when it's a question—as it usually is—of working through the weekend and on public holidays.

To increase the size of the accommodation of the Empire Stadium does not figure among Arthur Elvin's plans. He wants to improve the amenities, and increase the number of them, but he does not visualise greater and greater crowds pouring out there as the years pass. His prediction is that with the development of television the tendency will be for those with less money to spend to see their football matches and watch other big sports events on the television screen at the cinema. Therefore he keeps in mind the possible elimination of all standing room and the introduction of comfortable seating all over the Stadium.

In view of the increased demand for indoor sport he does contemplate certain additions to the seating accommodation of the Empire Pool.

He also wants to see the approaches to the Stadium and Pool improved by the laying out of grass and trees, with a main approach called Olympic Avenue and a service of flat-bottomed electric trolleys to convey people from the station to the Stadium or Pool.

He anticipates the biggest-ever boom in sport in the next few years and he is getting ready for it. He doesn't suggest that this boom is in any way due to him or to what he can offer at Wembley. The world has been starved of sport during the war years, and now it is clamouring for it. Opportunities for relaxation have been few, so they will be seized upon. There is a lot of money about and very little choice of what to spend it on. So long as goods are in short supply people will spend their money on sport and every event will sell out.

As a business man Arthur Elvin is attracted by that proposition. He sees in it the opportunity of consolidating Wembley not only as the greatest sports centre in the world but also as a great national centre for displays and demonstrations of all kinds.

Totectors mean fewer accidents— less lost working days



Recent returns show that no fewer than 2,000 man-years were lost in a single year by accidents to toes in industrial concerns. But this waste of valuable working hours and time is being rapidly reduced—thanks to **Totectors**, the new type of safety boots and shoes. The secret is in the toe caps. A special steel toe cap of extra strong tempered steel is fitted which prevents the toes from being crushed when struck by a heavy weight. **Totectors** give foot protection for all industries.

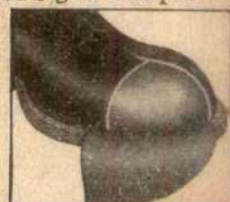
Write to Dept. 6 for samples.

Totectors

Safety Boots and Shoes with Internal Steel Toecaps.

WILKINS & DENTON (LONDON) LTD.
Granville Sq., Kings Cross Rd., London, W.C.1
Telephone: TERminus 5247

BRIGGS INDUSTRIAL FOOTWEAR LTD.
17/23, Dover Street, LEICESTER
Telephone: Leicester 20272



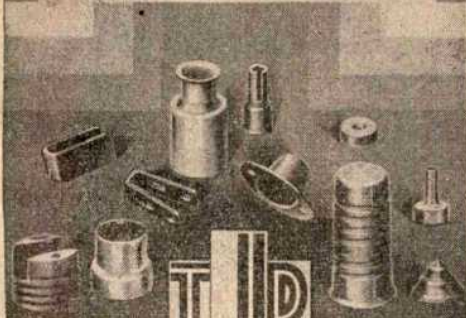
This diagram reveals the hidden strong steel toe cap which protects the toes when struck by a heavy weight.

CONTRACTORS TO
ADMIRALTY, AIR MINISTRY & WAR OFFICE

THOS. JOHNSON
(METAL PRESS WORKERS) LTD

MANUFACTURERS OF

**FERRULES & GENERAL
CUPPED PRESS WORK**

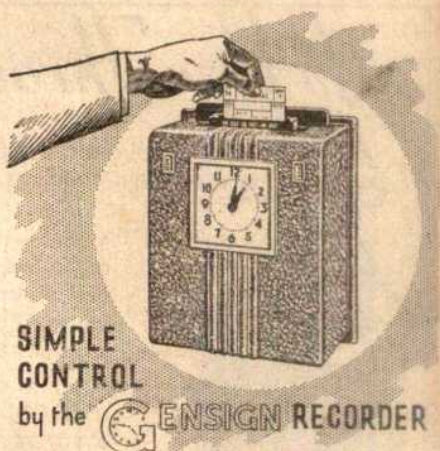


PHONE ASTON CROSS 2135-6

GRAMS THIRTEEN BIRMINGHAM

WHITEHOUSE ST., ASTON, BIRMINGHAM, 6

LONDON: 6 FELL STREET, E.C.2 GLASGOW: 62-64 VIRGINIA STREET,
MANCHESTER: 75 PICCADILLY



**SIMPLE
CONTROL**
by the **G**ENSIGN RECORDER

Electric-automatic, one hand, one operation. Compact, efficient, reliable. Suitable for large or small staffs and for all kinds of jobs. All types of equipment for Time Indicating and Signalling. Rental—Sale—Maintenance. Enquire for particulars of the Gensign Service.

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LEEDS: King Street Chambers, 1 King Street. Phone: 22840
BIRMINGHAM: 176 Broad Street. Phone: Midland 4144 & 6201

And also local agents in all important Industrial Centres.

WHAT IS A FAIR DAY'S WORK

Continued from page 68

demonstrated and it will be seen that the greatest saving lies in the raising of the day work speed up to incentive speed.

It is apparent that the cost recovery factor operates here according to the existing inefficiencies in the organisation; a well-equipped firm, priding itself on its planning, process and production control will still suffer a potential loss of efficiency up to 25 per cent, due to low working speed.

Where, however, there is the slightest suggestion that the efficiencies of the administrative sections are in doubt, then the percentage of loss-potential is liable to rocket.

Time study will spotlight the inefficiencies and make its contribution to the raising of the standards throughout the factory.

By the use of time study, a value in hours allowed for the task is established and this represents a break-even point since it is that point where the wages equal the expected return.

When the output rises above this target, the operator efficiency is said to be "plus," and conversely, where the output drops below this point, the efficiency becomes a "minus" in ratio to the target so set.

It will be appreciated therefore, that it is easy to reconcile the various working units

inside a machine shop and so compare the effective performance; likewise it is easy to see that by such a method, proportional analysis can be introduced that will give a day to day figure of overhead and direct costs. This makes the assessment of the profit or loss on any particular component available for early examination thus reducing many of the hazards associated with the carrying of unprofitable lines . . . a form of budgetary control.

The charting of these figures implies a certain centralisation of control, but it is well worth it for by no other method can an early decision be taken as to the continuation of the line under examination. This critical survey strengthens the management, it creates a state of sound finance and, because the figures are under constant review, exerts a pressure on the supervision to make their department the most profitable.

Profit is determined solely on the cost factor. This is a point that is often overlooked in manufacturing and is certainly ignored in all cases of wage claims.

Once the point is established that man-hour output controls costs (and this applies to overheads, *e.g.*, indirects such as drawing office, inspectorate, progress chasing, etc.) it is an easy step to ensure that man-hour output needs to be stepped up.

If, then, time study can do this, and all the evidence goes to show that this precisely does happen, then no competitive organisation can afford to ignore its possibilities.

In Use Throughout the World

Collams Duplicator appliances are known throughout the world for their high standard of manufacture.



M.10
Model

The M.10 Automatic Electric self-feeding Rotary model will reproduce perfect copies of any document required at the rate of 40 to 120 copies per minute.

Speed, Economy and absolute precision of work are outstanding features in its manufacture.

Supplies of these appliances are still restricted, and users will be well advised to preserve the life of their present duplicators—any adjustments can be made by Ellams.

Collams

DUPLICATOR CO. LTD.

Used by Government Departments and large industrial concerns throughout the world.

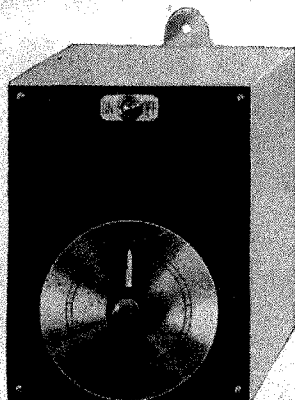
Astor House, Aldwych, London, W.C.2
Alexandra House, Bushey Hall Road, Watford

'Phone: Holborn 5365; and
'Phone: Watford 4221/4

BRANCHES IN PRINCIPAL TOWNS THROUGHOUT GREAT BRITAIN.

'SYNTIME' PROCESS TIMERS

For controlling the Time Period of SUN RAY TREATMENT, thus ensuring uniform treatment and eliminating over or under exposure.



Suitable for only
A.C. mains con-
trolled frequency

—
MASTER CLOCK
SYSTEMS

—
WATCHMAN'S
CLOCKS

—
STAFF LOCATING
SYSTEMS

—
INTERNAL TELE-
PHONE SYSTEMS

—
ELECTRICAL
MECHANISMS to
SPECIAL
REQUIREMENTS

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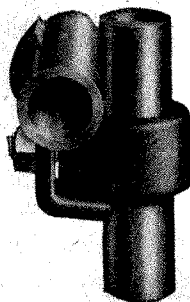
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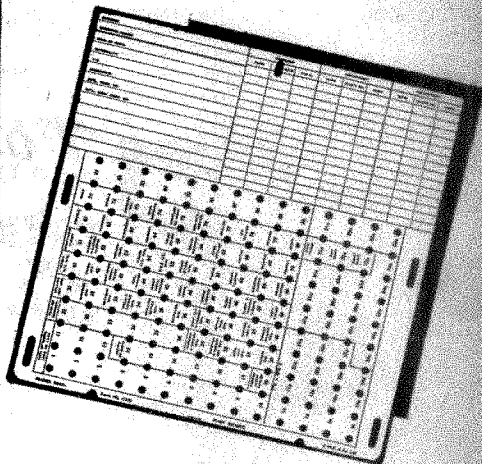
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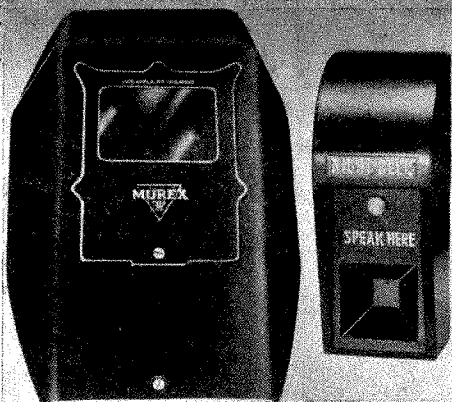
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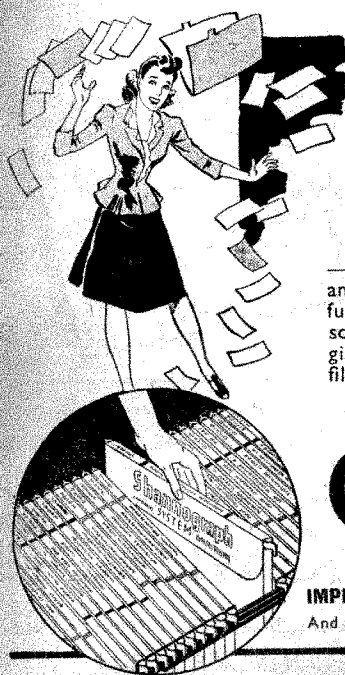
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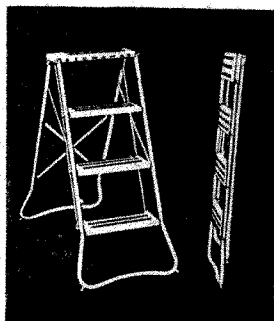
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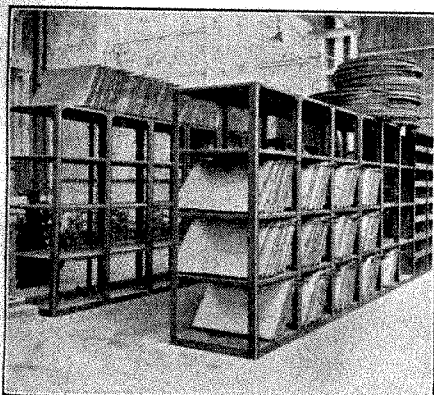
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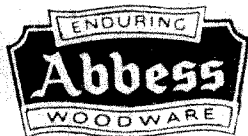
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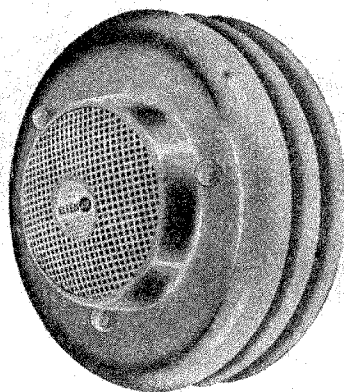
passenger lifts (for calling the operator and for emergency use), on goods lifts (goods clerk to lift attendant), offices (executive to secretary), and factories (works police and night watchmen to callers).

The small door unit which we illustrate measures only 10½ inches high by 4½ inches wide and 4 inches deep. It is fitted in the lift, the secretary's office or outside the works gate, as the case may be, and connects to a moulded bakelite hand telephone set, in appearance like the ordinary G.P.O. telephone. At night a small panel with the words "Night Bell" is illuminated to enable the caller to see the bell push.

More than one hand telephone set may be used with the loudspeaker unit, or, alternatively, a number of loudspeaker units may be used with one hand telephone set. For some of the purposes mentioned here the "Night Bell" panel is, of course, replaced by a blank section. It is worth noting that installation of the system involves no valves, amplifiers or mains. Current is taken from a 12 volt dry battery, and the connections are made by ordinary bell wire.

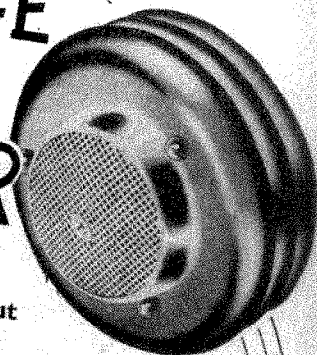
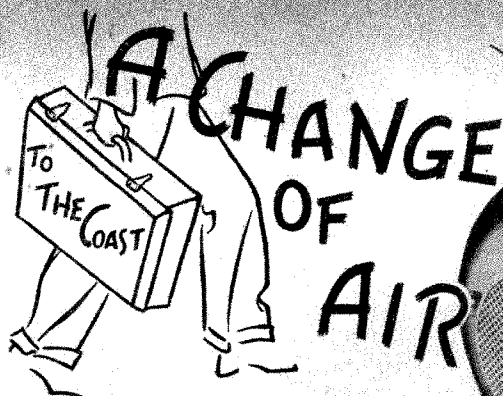
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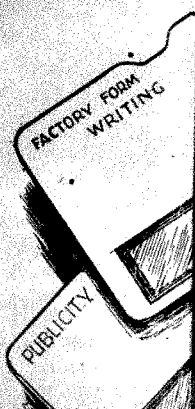
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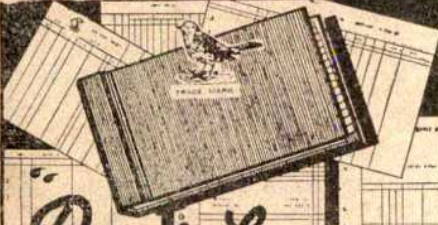
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By F. H. SLADE, F.I.Mech.E.

IN January BUSINESS means and methods to save material, time and labour in the painting and drying processes common to many industries were exemplified by examination of the plant which made a name during the war years in the production of the well-known jerricans.

Editorial space-pressure precluded continuing my story to the end of the production-flow process. I closed on the drying and firing processes without detailing the system. To conclude, therefore, I propose to take you back to figure 4 and continue from there.

In the *flash-off* of the inner coat which was necessary to prevent the pigment being washed off by the solvent during the stoving, peculiar difficulties had to be overcome to purge the volatiles; this was accomplished by introducing a douche of cold air directly into the filler cap neck opening of the inverted cans as they pass into the oven, followed by hot douche treatment as they pass through the heated tunnel on the conveyor. After cooling the cans move by roller conveyor to the next phase of the process which entails their being passed through the external coat "Flo-Coat" unit, drained, dried, cooled, and suspended in pairs from an overhead monorail chain conveyor.

Application of the external coat in the "Flo-Coat" unit is effected by jets of paint delivered by special pumps capable of circulating 4,000 gallons per hour, the cans passing through the chamber at 10 feet per minute. The unit is shown on the right of Figure 5, where it is observed that the con-

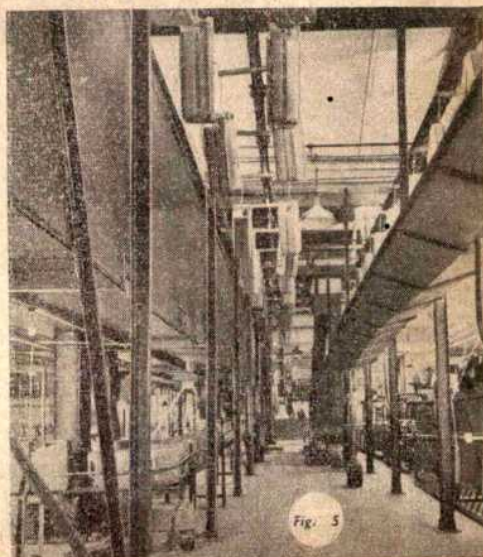
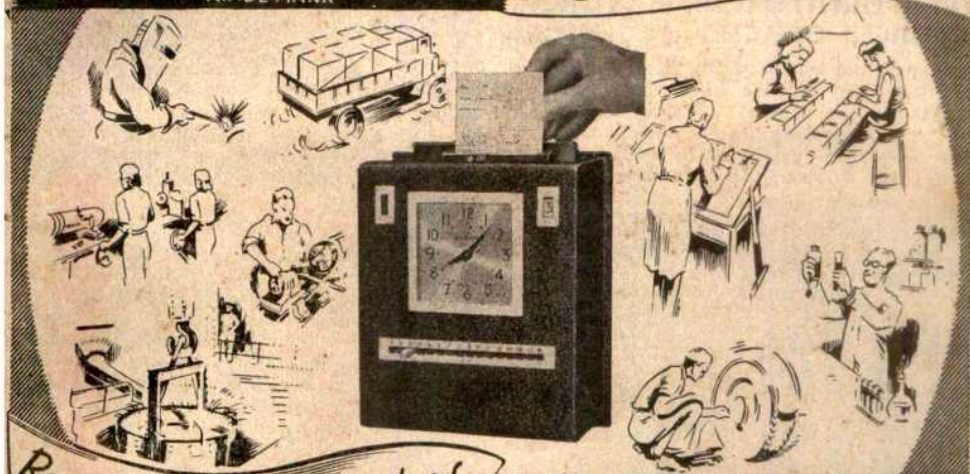


Fig. 5

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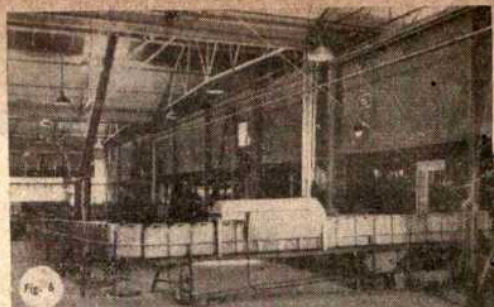


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veyor is brought down to a low level so that it can be loaded where it passes over the feed from the *Flash-off* cooling booth.

After coating, the cans are carried by conveyor to high level where recovery of surplus paint from off the cans is effected; the paint being collected in a 165 ft. sloping drainage trough fitted underneath the conveyor and returned to the pumps.

The cans are carried by the overhead conveyor through the external coat stoving oven shown on the left of Figure 5, or more in detail in Figure 6, being returned by roller conveyor past an inspection point shown in the foreground of the illustration as a completely processed article.

Further to this process of paint drying, such processes as drying, cooling, crystallisation, urgently needed for war purposes, there is a step at which it has to be solidified from a warm liquid.

This used to be done by running it to a depth of eight inches into earthenware vats in a chilling room at which it took 12 hours to solidify, and after that it was cut into strips about $\frac{1}{8}$ in. thick for drying.

When the demand for increased production became pressing, the process was conveyed and the material produced direct in $\frac{1}{8}$ in. strips in one minute. A further example is cited in the production of synthetic resins which formerly took from 24 to 48 hours. Hot liquid material was run out of stills into big iron trays, left to cool and solidify and subsequently broken out of the trays by hammer and chisel for crushing and grinding.

By running this material on to a water and air-cooled conveyor to a thickness of $\frac{1}{8}$ in., the solidified material on leaving the conveyor broke under its own weight, requiring no crushing and was ready for immediate grinding.

This process has been reduced to the astoundingly low figure of 1½ minutes for the same quantity of material produced. The type of equipment used is shown diagrammatically in Figure 7 and as can be seen at "A," it is readily adapted to any cooling, heating, drying solidification or crystallisation process.

The main cooling or heating is carried out by the bath under the steel band, which can either contain water or an eutectic solution heated or cooled directly as indicated; or in-



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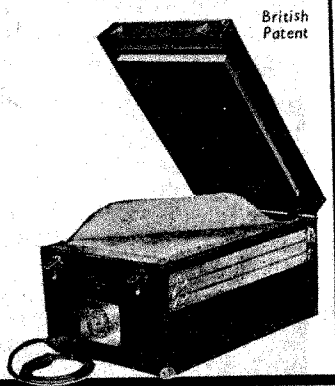
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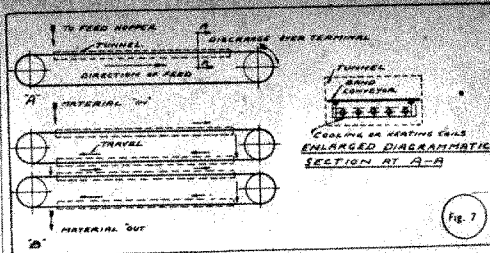
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A development of the system is shown in the lower portion "B" of Figure 7, wherein maximum use is made of a given floor area for process drying.

The material to be dried is passed from the top to the bottom strand of one conveyor, and passed in the same manner to a conveyor situated directly underneath.

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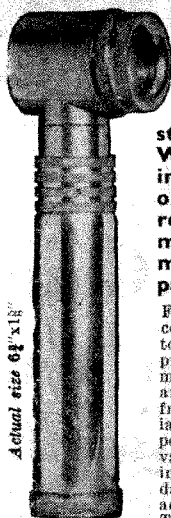
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IT is a well-known fact that overcrowding promotes infection: overcrowded transport vehicles, workshops, houses, etc. are the most dangerous and fruitful places for the interchange of respiratory organisms which give rise to the common cold and its sequelae of secondary infections, hence the slogan "Coughs and sneezes spread diseases—always use your handkerchief," which applies equally to cinemas, offices, workshops, etc.

The atmosphere contains vast numbers of living and dead particles derived from and dependent upon its soil, fauna, etc. Many seeds and pollens are adapted for aerial transmission but smaller living particles such as fungi, spores, bacteria, and viruses, remain suspended without such adaption.

Suspension of organisms in the atmosphere depends on movement of air, both vertical and horizontal and the size, shape and density of the particles, which do not fall with increasing velocity because the density supports or suspends them. It has been estimated that in a still atmosphere the rate of fall of a staphylococcus or a streptococcus, 1 micron in diameter (*i.e.*, 1/1,000 m.m.) would be one centimetre in five minutes and of a small droplet, as from a sneeze, about 18 inches in one minute. In the presence of a steady wind of ten miles per hour the organism would be carried a distance of 900 miles before reaching earth from a height of 10 metres.

If there were a rising current of air the particles would be carried upwards, the smallest to great heights. Air, for a mile up, contains many millions of bacteria and spores, above two miles up the number decreases rapidly, yet in 1936 Armstrong found them in the stratosphere 70,000 feet above the earth.

Organisms are present in rain and have been found in the falling snow of the Antarctic, many miles from their place of origin. Climatic factors govern the dispersal of air-borne organisms throughout the atmosphere, wind playing a great part while survival with some spores and organisms seems to be limitless.

They survive exposure to direct sunlight, heat, and dryness for weeks, yet strangely enough they die quickly on exposure to sunlight in the laboratory.

Most respiratory infections occur indoors and are undoubtedly the greatest cause of absenteeism and mortality. That air was a vehicle of contagion and infection was believed hundreds of years before the germ concept of disease was known and one of the most surprising discoveries associated with the latter is the extent to which sneezing can load a room with bacteria.

Dust clouds caused by sweeping have a rapid settling rate but the atmosphere is impregnated with finer particles to which droplets and organisms attach themselves thus remaining in a state of suspension, the larger particles being caught in the nose and upper respiratory tract while the smaller ones reach the alveoli of the lungs.

Of the tens of thousands of droplets expelled during a sneeze some two-thirds of them are air-borne so that air, like water, can become polluted bacterially as well as chemically.

In inhabited areas colds are readily acquired without direct contact with a human sufferer; the risk of course being greatest where the air is heavily contaminated.

Prevention of infection might be best achieved by living and working in incubator type houses and factories, making ourselves

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so nesh in the process of protection that we would not dare to mingle in society or venture to open our front door—a cheerful Gilbertian prospect—as is that of wearing a facial mask which might be suited or unsuited to our individual beauty.

Fortunately other methods of protection have been devised and tested in the laboratory and these include the suppression of dust by oiling floors and fabrics. This method, however, is only suited to certain types of business premises and does not produce any antiseptic action upon the air itself, or upon the droplets which are blown into it.

It is a supplementary procedure to disinfection of the air by ultra-violet rays or by special chemical disinfectants atomised into the atmosphere.

In 1936 radiation of the upper air with ultra-violet light was introduced with the object of destroying as many bacteria as possible. Ultra-violet rays can be used in three ways for atmospheric disinfection:

(i.) They can be directed upwards to produce a radiated ceiling, convection currents carrying the organisms upwards where the air is radially disinfected.

(ii.) The rays can be directed downwards and lamps combining the function of radiating the ceiling and producing a barrier are known as "direct-indirect" types to distinguish from the simple "direct" types which radiate upwards only.

(iii.) Ultra-violet lamps can also be introduced into air-conditioning plant. Unfortunately

air-conditioning does not give that degree of disinfection which might be expected and the limitations of ultra-violet light must also be accepted because the rays have practically no penetrating power in a dust laden atmosphere.

Bactericidal mists or sprays have not been investigated under field conditions to the same extent as ultra-violet radiation and air-conditioning, but a large amount of laboratory work has been done both in this country and America.

The experimental work has so far been in ideal or artificially produced conditions so that the results are only a guide to that which prevails in an occupied room with opening and closing of doors.

Technical difficulties are being overcome and reports on the value of chemical spraying of the air in army barracks and hospitals are now coming to hand, and practical experience may well prove that the three methods are complementary one to the other.

Atmospheric spraying has one obvious advantage over air-conditioning or ultra-violet radiation, that is the fine mist liberates the air from contaminations such as bacteria, pollens and dust, in other words, it "washes the air."

To be effective the sprayer must be of the pressure type with a nozzle capable of ejecting a wide fan-shaped mist which will spread in all directions and "settle" in the atmosphere for a few seconds before sinking slowly to the ground.

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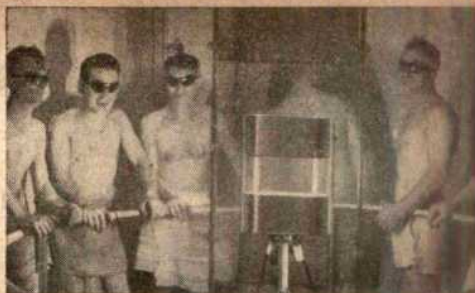
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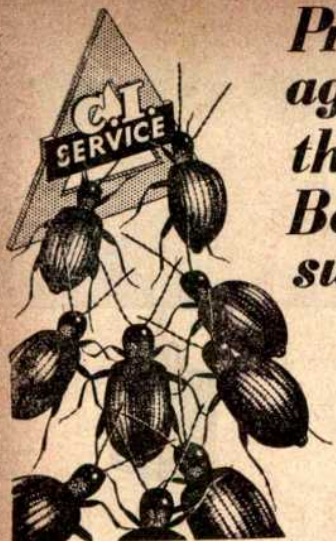
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Efficient hand-type sprayers giving a suitable mist can also be obtained.

To be of value the solution used must conform to stringent standards. High germicidal activity is number one condition—and, here a few words on the germicide may not be out of place.

It must be stated that the standard of estimation of germicidal activity, or germ killing power, is an arbitrary standard based on the comparison of the disinfectant in dilution with carbolic acid.

If a substance diluted with 100 parts of water will inhibit the growth of an organism in the same time and under the same conditions as carbolic acid, it is obviously 100 times more active against that specific organism.

That, briefly, without technical and mathematical detail, is the method employed in estimating the activity of an antiseptic or germicidal chemical.

Essential Characteristics

Germicides readily water soluble and/or soluble in air have very little activity as atmospheric antiseptics—the reasons are too complex to be mentioned here, but manufacturing processes and emulsification play no small part in the efficiency of the final diluted solution.

A further condition to be observed in atmospheric spraying essences is that they must be non-irritating to the skin, eyes, nose and throat; they must not stain fabrics, furniture or floors; they must be pleasing in odour and should stimulate the senses to a feeling of invigoration and well-being.

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Essential oils blended "secundum artem" give a pleasing range from which to choose, the non-floral type for male offices, the floral perfumes for cinemas and buildings where ladies predominate in numbers.

The pine type, used in humid atmospheres, workshops and buildings where heat predominates gives to the worker a refreshing, clean inhalation of air in contrast to the "foetid human" odour which so often permeates a heat laden atmosphere.

These essential oils also have a virtue little realised, or else forgotten, in the prevention of air-borne infections. For many years they have been prescribed in various preparations for the treatment of colds and catarrh, principally in the form of inhalations which at some time or other many of us have used.

They soothe mucous surfaces, reduce inflammation and by their antiseptic emollient properties give a protection to the nasopharyngeal tract.

They all possess germicidal properties, some of them to a marked degree, and when combined with a suitable germicide of high potency serve the dual purpose of inhibiting the causative organisms and allaying or preventing inflammation of the mucous surfaces where the common cold organisms make their home.

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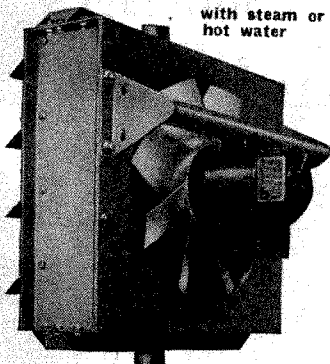
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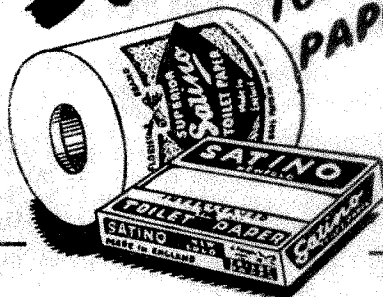
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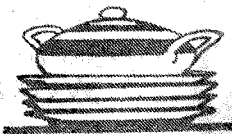
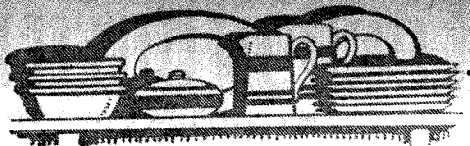
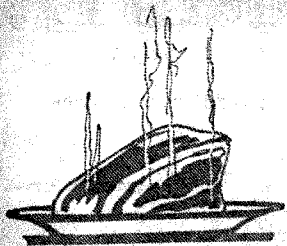
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Canteen

The Advisory Panel Discusses Three Shortages Food, Fuel and Staff

What is the most urgent problem confronting every canteen manager today?

MR. F. MOON: Most definitely the shortage of labour.

MR. JENKINS: Particularly in the kitchen.

MR. MOON: It is just an extension of the wartime problem which we hope will ease itself as soon as the Services are demobilised. We are finding it is easing itself in the higher grade, but not in the lower-grade kitchen staff. However good a canteen manager is, he cannot produce a meal for workers without sufficient kitchen hands. And that is his need today.

Q. M.: Can you suggest a way of meeting it?

MR. ABRAHAMS: There are several training schemes which cover the most important question of managers, and to some extent, cooks, but I don't know of anything myself where the general worker is trained. Each caterer has to train his own staff. But of course, the standard of labour that we have been employing during the war in some instances hasn't even been trainable.

Q. M.: Then that raises the difficulty of the smallish firm, which would not be able to set up its own training scheme. Is there any possibility of co-operative training schemes?

MR. MOON: The trouble is, after the small firm has trained its employees, they are taken by the larger firm that can pay high wages.

MR. ABRAHAMS: I can't say I have had that experience myself.

MR. MOON: Staff can still walk out, even if you pay high wages.

MR. ABRAHAMS: One difficulty we have is that a lot of these poorly trained staff won't travel further than a 14d. or 2d. ride. But the general staff who have left us, have left because of really genuine reasons—because their husbands or sons have been demobilised.

MR. JENKINS: Before staff are fully trained, or have been able to start work, they are

often wanted to fill other jobs. You have to use them before they are really ready.

Q. M.: You wouldn't like an E.W.O. to apply to you?

MR. JENKINS: We don't seem to get any assistance from the Ministry of Labour as it is. The only difference would be that we would be engaging staff through the Ministry instead of through our own channels.

MR. MOON: Our market is limited to the extent that we can only draw labour from people who are not scheduled under the E.W.O.

MR. JENKINS: That will soon be washed out with the cancellation of E.W.O.

MR. MOON: Married women and other part-timers have helped quite a lot.

Q. M.: Then the labour problem is still the most urgent problem confronting the canteen manager, though the situation is becoming easier at the higher levels.

MR. JENKINS: It is worse at the lower levels. It is only easier in management. There is no sign of the situation improving. It is worse than it was six months ago.

MR. MOON: Certain people are being released who have a great idea of their own capabilities; when they are only equal to peacetime assistants, they are quite sure they could be managers.

MR. ABRAHAMS: What we have had is the manager type of person who wants to be managing director; but among the lower levels we find very few who want to get on.

MR. MOON: They were in the Forces as N.A.A.F.I. managers, etc., and they think they can do the same job in civilian life.

MR. JENKINS: We still ask for pre-Service commercial experience.

Q. M.: In obtaining the lower class of labour do you prefer to have assistance from the Government?

MR. MOON: Government help is only there in theory, not in practice.



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Planned Meals Save Food

The Government has appealed to the country for a vigorous food economy drive. How can the canteen manager play his part in the campaign?

Q.M.: The "Don't Waste a Crumb" slogan is a good example of this. We are always hearing of the great wastage of food going on in the Services, where tons of food have been thrown away. Does this occur in factory canteens?

MR. ABRAHAMS: Of course, in a well run commercial organisation there is no room for waste. The canteen manager must run his canteen on economical lines, because it is only on that margin that he is able to run it at a profit.

MR. JENKINS: There may be waste in canteens run by industrialists in their own factories, but not in those run by experienced caterers, whose livelihood depends on absence of waste.

MR. ABRAHAMS: As to the latter part of the question, the canteen manager has to make the best use of what is available.

MR. MOON: One method we have adopted during the war to overcome waste of vegetables is to put two extra dishes on the canteen counter, put an average meal on the plates, and let the men who want extra vegetables help themselves.

MR. ABRAHAMS: I think we all do that.

Q.M.: Is there much waste of vegetables, then?

MR. MOON: Unfortunately, the average person's appetite varies, therefore you must work to the lowest appetite and let them help themselves to their individual tastes.

MR. ABRAHAMS: This question of not serving bread with meals doesn't apply in canteens. In very few cases is a slice of bread given with a meal, so that if a man wants it, he asks for it and pays for it. And as the average man has not got money to throw about on food he does not want, he won't pay for it.

MR. JENKINS: Some of my canteens provide bread if it is wanted, but I have never found any considerable waste of bread. If the bread is cut in smallish pieces, about half or quarter slices, rather than in whole slices, they take what they want, and don't waste it that way.

Q.M.: What about the sweet course?

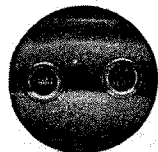
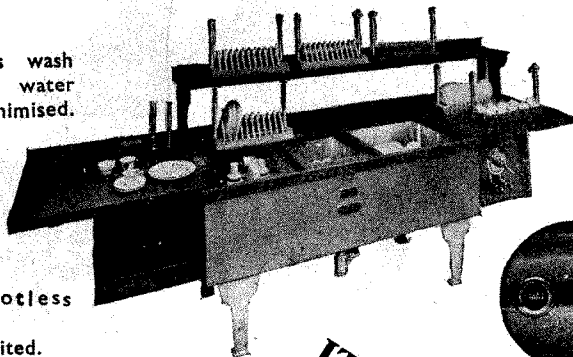
MR. JENKINS: The difficulty is to devise new sweet courses. We are harder hit there than anywhere else, especially in the winter, with the absence of soft fruits.

MR. ABRAHAMS: It would be foolish to say there is nothing we can do, but I cannot think of any big step we could take that would make any difference.

There was a time when many of our canteens used to boast of the large amount of pig swill they collected. Today it is very difficult to get people to call for the food,

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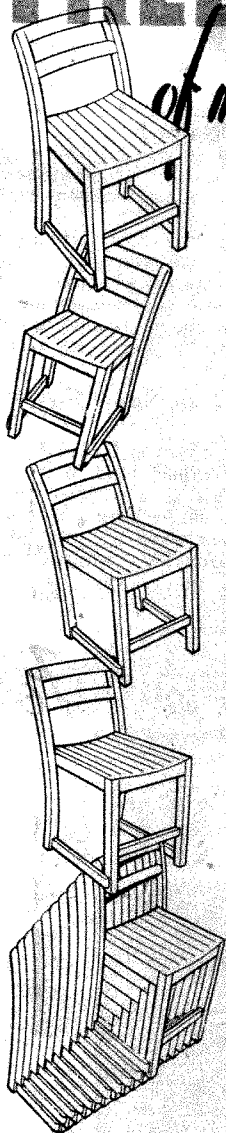
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and that is, after all, the test of what waste there is in the canteen. If the collector complains that there isn't any, you know your own manager is doing his job.

MR. ABRAHAMS: The question of costing and rationing control is sufficient guarantee that the waste—where there is waste—is cut to the minimum.

The working man wants the best and unless you are going to work right down to the nearest grain of tea, you won't get the numbers out of the pounds that you are allocated if there is any waste at all.

Q.M.: I suppose your worst experience is where there are fluctuating numbers in the canteen?

MR. JENKINS: My experience is that the number of customers does fluctuate, but not violently. When you open a new job for the first time, although you are working in the dark, within a week you are able to judge the number of workers within a very few.

Three Ways to Save Fuel •

Recently, unexpected cuts in fuel and power supplies have almost ruined food in the process of cooking. This is a serious matter, even in one's home, but it means a tremendous loss of good food when it occurs in the canteen. Can the Brains Trust suggest (apart from fore-knowledge of a likely cut) any

means by which cooking processes need not be interfered with by these cuts, and food attractively served?

MR. MOON: I myself have never experienced it because they usually occur about breakfast time.

MR. ABRAHAMS: My experience was that most of the cuts were known in time to adjust the catering. But of course we did get some meals spoiled, though steam puddings can be warmed up again with an extra steaming. With vegetables, though, you just cannot do anything once they have been put in.

MR. MOON: Catering processes are bound to be limited. If you have an opportunity, it is better to delay the meal an hour or so, and announce that lunch will be a little late.

MR. ABRAHAMS: In places where a proportion of the workers go home to lunch, this is out of the question.

MR. JENKINS: One way in which the lack of fuel might be overcome if it becomes serious, but which, I am afraid, won't be a very popular one, is an extension of the hay-box idea. In this, a minimum amount of fuel is used to start with; then the heat is retained until the food is cooked. But the range of dishes is very restricted.

MR. ABRAHAMS: It also destroys the nutritive value in vegetables.

MR. JENKINS: It isn't to be recommended, but it is useful in emergencies.




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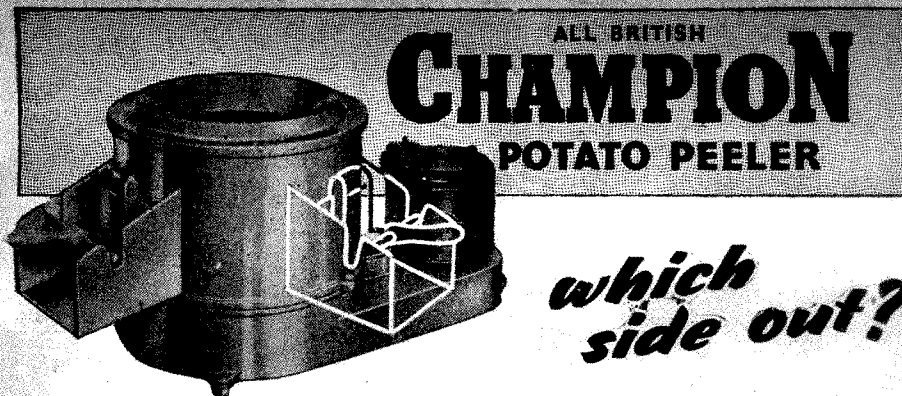
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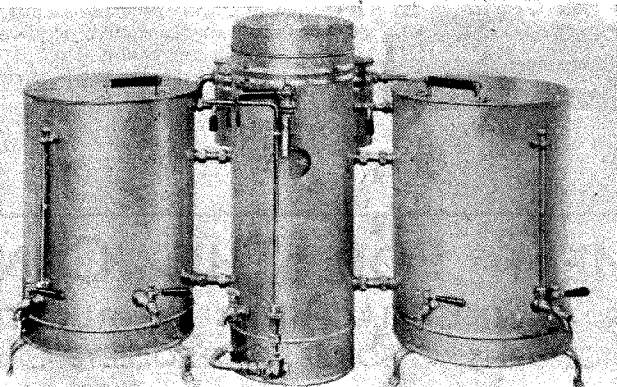


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Tubular metal nesting furniture solves the problem of lack of space and labour. Clean, comfortable, attractive and easy to move metal nesting furniture will stack away when not in use, retaining its fresh appearance indefinitely, with the minimum of maintenance.

Manufactured by—

Cox & Co. (WATFORD) LTD.
WATFORD-BY-PASS, WATFORD, HERTS.
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MR. ABRAHAMS: We were able to turn to good account, a solid fuel apparatus which had been installed during the war.

Q.M.: Do you think it would be a good thing to make a secondary means of cooking available?

MR. ABRAHAMS: It doesn't look as though it is likely to be necessary before next winter.

MR. MOON: When we instal new ovens, wherever possible, we put in one gas and one fuel.

MR. ABRAHAMS: We supplemented our cookers by a double solid fuel cooker which got us through our emergency. The cost was very cheap.

MR. JENKINS: The hay-box of course, requires very little fuel.

MR. MOON: But you must be forewarned.

MR. JENKINS: Unless supplies are so low that you know there is a general shortage, when you can be prepared.

Q.M.: You cannot cook the night before and warm it up?

MR. JENKINS: We have tried to get away from it for years.

MR. MOON: The canteen manager is always accused of putting on yesterday's meal to-day. We have always tried to get away from that and to provide the meal immediately it is required.

MR. JENKINS: Gas in particular can be used the previous afternoon when the pressure is higher. We did have to do that once or twice when a particularly large joint was received and it was obvious that with low pressure, the joint would never cook in time. It has to be partially cooked on the previous afternoon. That is, of course, a matter for local resources.

Q.M.: The answer, therefore, is three-fold. In the first place, you can delay the hour at which you serve the meal; secondly, you can have an alternative method of cooking the meal—using solid fuel, for instance; and thirdly, you can cook part of the meal the night before.

EQUIPMENT FOR THE CANTEEN.

LABOUR SAVING MACHINES OF ALL TYPES.

TEA SERVICE URNS - BOILERS - TROLLEYS, ETC., ETC.

Write for full particulars—

KITCHEN MACHINES LTD.

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Telephone: HOLborn 8556.

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mean better

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TEA URNS**

but it will
mean

**EVEN
BETTER
DELIVERY**

We shall be pleased to see you at our
NEW SHOWROOMS

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Harlesden, London. N.W.10

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AND
C H A I R S

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FURNITURE

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REST ROOMS**

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IT'S A GIFT
if you wash them with
GUSTO

DISHWASHING can be a sticky problem
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No matter how dirty the dishes, Gusto will clean them rapidly and effectively. Gusto is a non-caustic detergent that is specially designed for dishwashing: it is simple to use, does not foam or lather and rinses easily. It has good germicidal and deodorising properties. Why not introduce Gusto into your kitchen? It is not rationed. For additional information please write to us.

GUSTO

THE SOAPLESS DETERGENT

Thomas Hedley and Company Limited, Newcastle-on-Tyne.

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RATE. 4/6 a line (average 7 words to a line). Minimum 3 lines costing 13/6; each additional line or part of a line 4/6. Box No. counts as one line and is to be paid for; replies are forwarded free of charge; 2½% discount for 6 insertions, 5% for 12. Payment with order for single insertion.

AGENCIES

Calculating Machines and Typewriters to Denmark: Big Danish firm with extensive sales-organisation and branches in the main cities is interested in sole agency for Denmark for calculating machines and typewriters and also other office machines. Box 545, Polack's Annoncebureau, Copenhagen, Denmark.
Cash-Registers to Denmark: Absolutely leading Danish firm with extensive sales organisation is interested in sole agency for Denmark for English cash-register. Box 546, Polack's Annoncebureau, Copenhagen, Denmark.
Portugal. English partner of Portuguese Importers, shortly returning Portugal seeks sole agencies. Box 646 c/o BUSINESS, Whitefriars House, Tallis Street, London, E.C.4.

APPOINTMENTS VACANT

Famous light engineers have Works Managerial vacancy on highest level; only those currently in sole control modern large-scale production need apply, must state salary expected. Box 643 c/o BUSINESS, Whitefriars House, Tallis Street, London, E.C.4.
Costing Clerk required by Company on the western outskirts of London. Knowledge of Civil Engineering (Site Office) an advantage, wages analysis, cashing, job records, progress reports, etc. Good prospects. Commencing salary £250-£350 P.A. according to qualifications. Write c/o Box 647, BUSINESS, Whitefriars House, Tallis Street, E.C.4.

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SEVEN-DAY COURSE IN ECONOMICS, Pocket Size. Economic Laws, Definitions and Theories, 52 Pages 2s. 9d. R. A. Starnes, F.C.I.S., 87 Ferney Road, E. Barnet, Herts.

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Factory wanted urgently by Company engaged on export drive. Covered area to be not less than 20,000 square feet, on a site area of at least 2½ acres. Requisitioned property would be considered. Confidential information leading to the above suitably rewarded. Greater London Area if possible. D. Sebel & Co. Ltd., 55 Lant Street, S.E.1. Hop 3803.

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Valuable Site for Factory or Works half way between Cardiff and Newport. Over three quarters of acre entirely freehold and free from any incumbrance with property—£1,500 to £1,800. Apply Box 644 c/o BUSINESS, Whitefriars House, Tallis Street, London, E.C.4.

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Steel Hat and Coat Lockers, Secondhand, in good condition, 1,000 available. Also Steel Shelving, 100 floor type 2-gall. Fire Extinguishers. To View. Marodin Disposals Co., 140 Highgate Road, N.W.5, Gul, 2100.

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Burroughs Calculator (non-electric), 13 column & s. d. Perfect condition. Price £80. Parry, 41 Belmont Rd., Bushey, Herts.

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Lagonda Limited, Lagonda Works, Staines, Middx., have, surplus to requirements, and for disposal, three Class 71 Burroughs Machines, one Class 72 Burroughs Machine, three Burroughs Duplex Adding Machines, one Cheque Writing Machine, one Brandt Coin Issuing Machine, two Time Recorders.

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Simplified procedure, Ivorine. All problems one setting, read answer £ s. d. Directions. Fits jacket pocket. A "good buy". Send 8/-. Sole distributor, J. D. Maclean (261) 1/3 St. Paul's, E.C.4. Any type calculator made on request.

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Advertisers urgently require offers of second-hand Time Recorders (all types), either single machines or complete installations, purchased outright—good cash prices paid for suitable machines; distance no object. All offers dealt with immediately. Commercial Recorders Ltd., 6/7 Park Square, Leeds 1. Tel: 21479.
TIME RECORDER WANTED. State make, condition and price. Write Box 960A Smiths' 100 Fleet Street, E.C.4.

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Cash-Registers (2-drawer type) urgently required. Please write stating terms, etc., to Edmonds (Supplies) Ltd., 240a Oxford St., W.1.

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CANTEEN TABLES

RIGID TYPE

ENAMELLED TOPS

Illustration shows standard 4'x2' Table (the most popular and easily produced size) with oak or hardwood legs and under-frame, recessed enamelled top with black or green flanges. Top free from sag by insertion of frame under flanges with cross supports where necessary.

Prices sent on receipt of enquiry, with particulars of folding type—

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"Should we agree to their terms?"

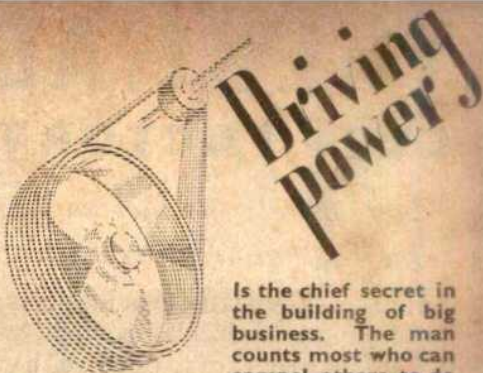
PROFESSIONAL and business men have a point in common; they frequently need to make swift decisions which must be based on the most accurate information. To do this effectively, immediate speaking contact between executives and staff, with facility for documents, files and other information to be consulted whilst conversations are in progress, is a necessity. A.T.M. Inter-communication Telephones provide this service to perfection and are obtainable for a very moderate rental charge. Write or telephone our nearest branch for details and rates.



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Main Branches:—Manchester, Leeds, Birmingham, Bristol, Glasgow.
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A1202/3-CVI



Is the chief secret in the building of big business. The man counts most who can compel others to do

his will; he gets things done he cannot do himself.

That is also the secret of the dictating machine; it enables you, better than anything else, to get things done. It is an inexhaustible reservoir of driving power, always at your command. Through it you best impose your executive will on those who have to carry out your ideas.

Studied plans or casual half-formed ideas for future development—the dictating machine catches them all, instantly, automatically and infallibly. You never lose a detail of your executive thinking. No waiting, no delay, no mistakes.

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Dictaphone *Dictating Machine*

will double your capacity
TO GET THINGS DONE.

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Telephone: HOLborn 4161 (5 lines).

And at MANCHESTER, BIRMINGHAM, BRISTOL, GLASGOW,
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and BELFAST.

THERMAL LINKAGE

CUTS FACTORY'S FUEL BILL 35%

Not merely a fuel-saving theory, but a proven fact.

THERMAL LINKAGE saves fuel, cuts production costs, increases output.

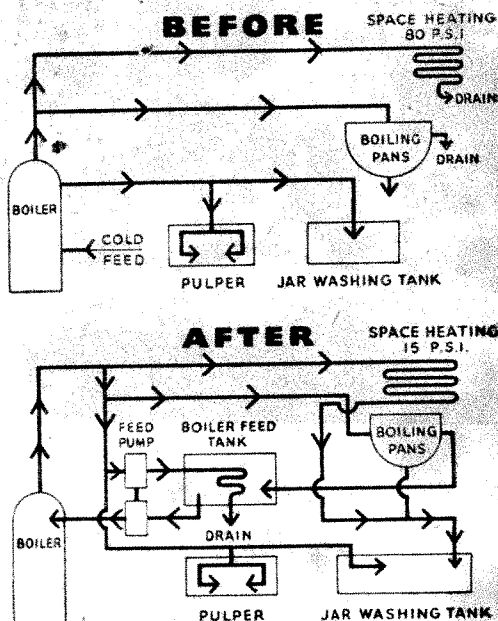
These are facts, proved by experience.

Thermal Linkage is no new experiment; no temporary device to overcome the fuel shortage. It is a proven principle of practical value already in use in many progressive plants.

Stated briefly, Thermal Linkage means overhauling and integrating your various heat-using processes, and, as far as possible, operating them as a single co-ordinated heat-using unit. Instead of heat being supplied independently to several separate points of consumption, and the surplus going to waste, it is circulated from point to point and none wasted while there is work for it to do.

PUT THERMAL LINKAGE INTO PRACTICE

What THERMAL LINKAGE does in other plants it can do in yours. In converting or reconstructing do not miss the chance to increase plant efficiency and production at lower cost by adopting THERMAL LINKAGE. For general information see *Fuel Efficiency Bulletin* No. 21 ("The Construction of a Factory Heat Balance") or, for specific advice and guidance, contact your Regional Office of the Ministry of Fuel and Power.



AVERAGE SAVING 35%

A Jam Factory used an average of 7 tons of coal weekly to provide a steam load of 1,630 lb./hr. at 80 p.s.i.

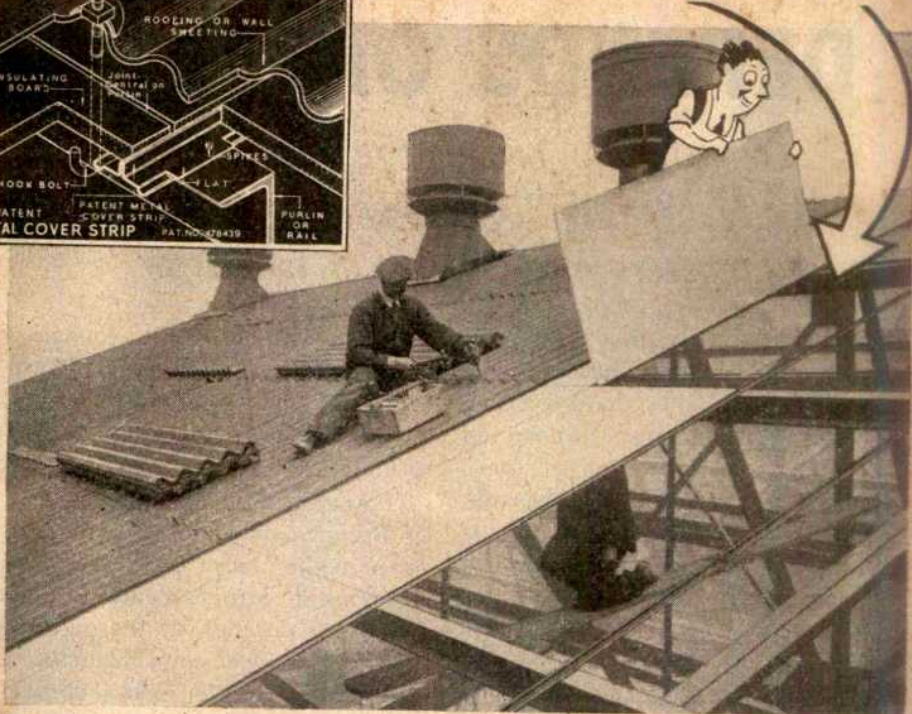
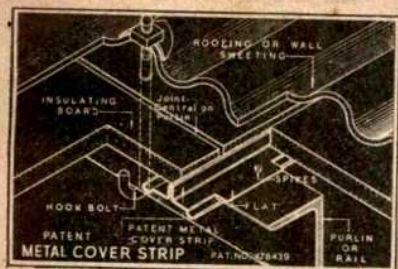
Along with the introduction of THERMAL LINKAGE the following adjustments were made to the plant. **BOILER HOUSE:** Boiler efficiency raised 3% by attention to detail. Exhaust from boiler feed pump put through a heating coil in the feed tank. Excess temperature relieved by introducing a shunt line to jar washing tank. **BOILING PANS:** Individually trapped and air-vented; jackets lagged; blow-down cocks connected to jar washing tank. **SPACE HEATING:** Steam pressure for space-heating reduced to 15 p.s.i. and thermostatically controlled to 55°F. All condensate from heating and process units returned to the boiler feed tank.

RESULT: Steam consumption reduced from 1,630 lb./hr. to 1,200 lb./hr., effecting an average fuel saving of 35% and an annual cut of £360 in coal alone. Output from Boiling Pans increased.

For full details and complete diagrams of this abbreviated Case History see No. 30 of the *Fuel Efficiency News*, dated October 1945.



PUT TENTEST HERE — says George



A half-inch layer of TenTest insulating board between purlins and corrugated roofing reduces the heat loss through the roof by 73½%. The following figures relate to the insulation, by the Patent Metal Cover Strip Method, of a typical factory roof of 100,000 sq. ft. and are based on Chart 1 of Fuel Efficiency Bulletin No. 12 (Ministry of Fuel and Power).

Capital saving on heating plant - £6,500

Cost of insulation @ 9d. sq. ft. - £3,750

NETT CAPITAL SAVING - £2,750

Fuel saved per heating season - 570 tons

Annual value of fuel saved

@ 50/- per ton - **£1,425**

Note that the fuel saving alone would pay for the insulation in about 2½ years.

TENTEST FIBRE BOARD Co. Ltd.
75 Crescent West, Hadley Wood,
Barnet, Herts. Barnet 5501 (5 lines)

MAY 1946

If you would like to study the effect of Structural Insulation in *your* buildings, either existing or proposed, send the coupon below and our technical representative will make a free survey and give you facts and figures.

If you decide to insulate, our Specialised Construction Department is fully equipped to undertake supplying and fixing complete to ensure your entire satisfaction.

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Please put your technical representative in touch with us.

NAME

POSITION

FIRM

ADDRESS

PHONE

Type of building

Proposed or existing

OUR PROSPERITY DEPENDS ON THEM

Over 16 million strong, the "younger generation" of today will be the masters in the world of tomorrow

CALMLY, but irresistibly, the post-war era has ushered in a new "younger generation" — resolute, hard-working, ambitious, the men and women of Britain under 35, to whom so much is owed, on whom so much depends. They are a big family, this "younger generation," and it is their initiative, their ability, and their strength of purpose that will form the backbone of our world of tomorrow.

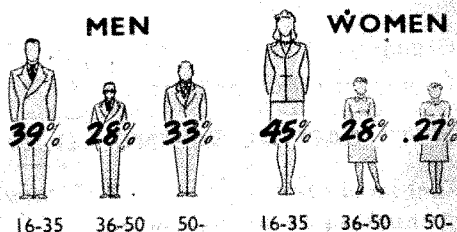
Thus, the study of the shape of things to come means the study of the ideals, the problems, and the viewpoint of this "younger generation." For what they think and feel today will determine the fundamental pattern of all our lives in the years ahead.

But what are the interests and problems of this vital group of citizens? For a long time past, it has been one of the chief aims of the Daily Mirror to reflect the developing viewpoint of the "younger generation." The success of this policy can be gauged from the fact that today a greater proportion of the Daily Mirror's readership is under 35 than is the case with any other national newspaper. In fact, over 42% of the Daily Mirror's net sale of 2,400,000

is among this ambitious "younger generation"—the young men and women who are planning for tomorrow, who need homes and possessions now and in the years to come.

This indeed is a large slice of the youth of Britain, and although the advertising space in the Daily Mirror is temporarily overbooked, business enterprises whose prosperity depends on the goodwill and custom of these all-important citizens will eventually be able most effectively to reach them through the columns of their own newspaper — the Daily Mirror.

WHO READS THE DAILY MIRROR? WHAT ARE THEIR AGES?

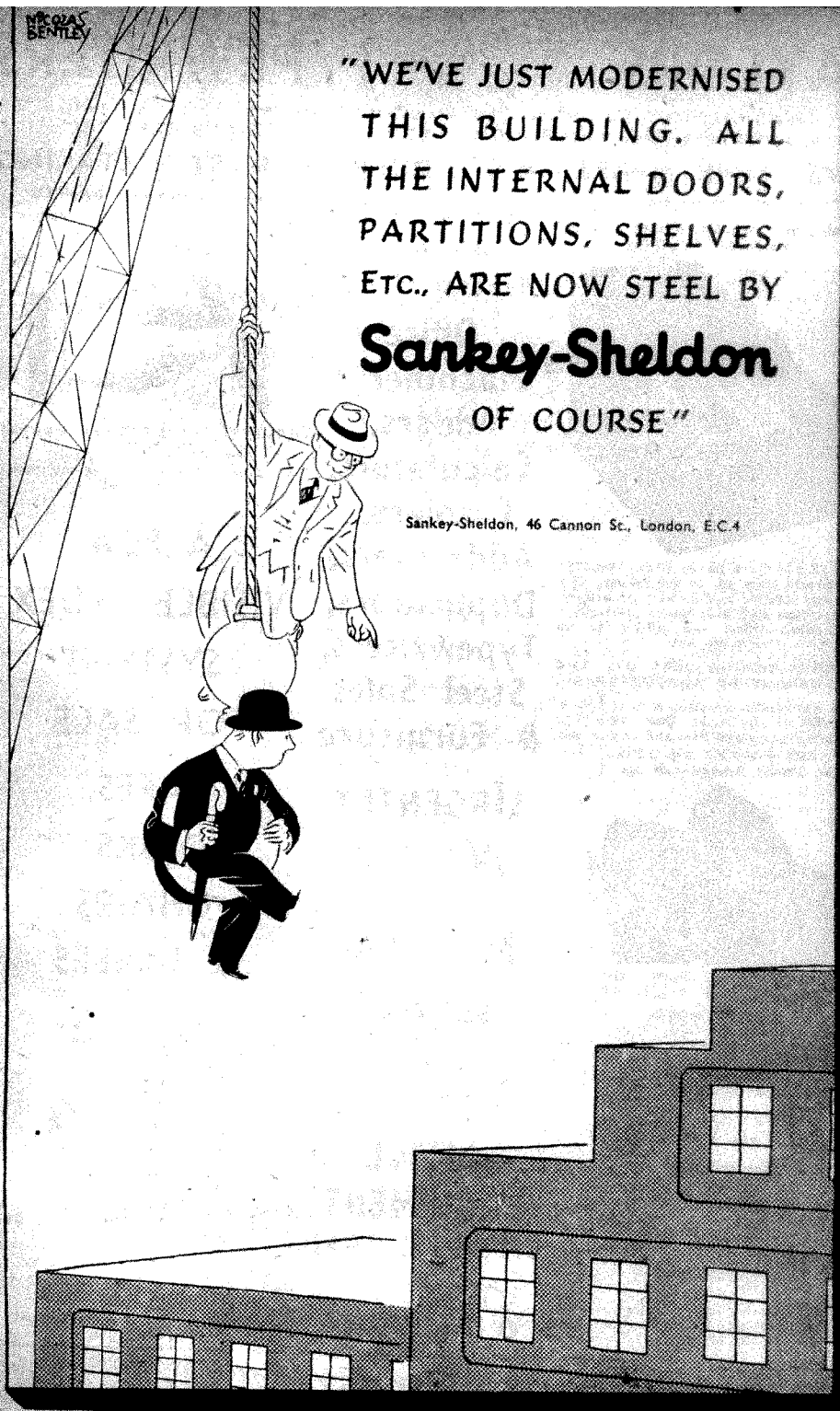


DAILY MIRROR

Net sale in excess of 2,400,000 — Second largest in the world

"WE'VE JUST MODERNISED
THIS BUILDING. ALL
THE INTERNAL DOORS,
PARTITIONS, SHELVES,
ETC., ARE NOW STEEL BY
Sankey-Sheldon
OF COURSE"

Sankey-Sheldon, 46 Cannon St., London, E.C.4



TAYLORS FOR ALL TYPEWRITERS

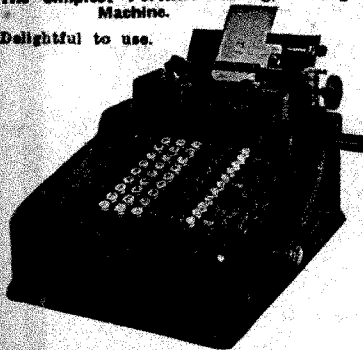
Adding Machines, Duplicators, Cash Registers, Calculators, Time Recorders,
and All Business Appliances BOUGHT AND SOLD, HIRED AND REPAIRED

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The Simplest Portable Adding, Listing
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Hand and electric models with or without
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Rests flat on the books. For Decimal or
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So Simple Anyone can use it.

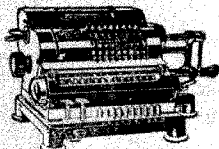


In Flush-fitted, ducoid case.
Size, 11½ × 2½ × 1 in., £4 15s.

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Adds to £9,999 19s. 11½d. Price £5 6s.
When ordering state for what purpose
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ordinary figures and Indian money, in
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ALL MAKES**



For all calculations. Multiply, divide,
add and subtract in 1/10th time taken
to do so mentally.

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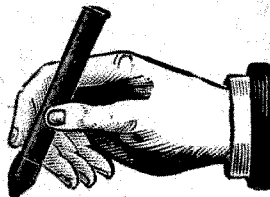
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Makes of Modern

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Adders,
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& Furniture**

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Turn your
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INTO CASH**
and help the
War Effort

THE ALL-RUBBER DAMPER
gives squeeze control of moisture.

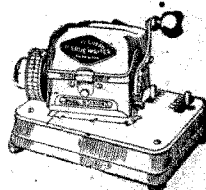


THE TAPPIT ALL-RUBBER DAMPER.

Ever Ready and Hygienic.
A squeeze controls feed of moisture.
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FOR SPECIFYING

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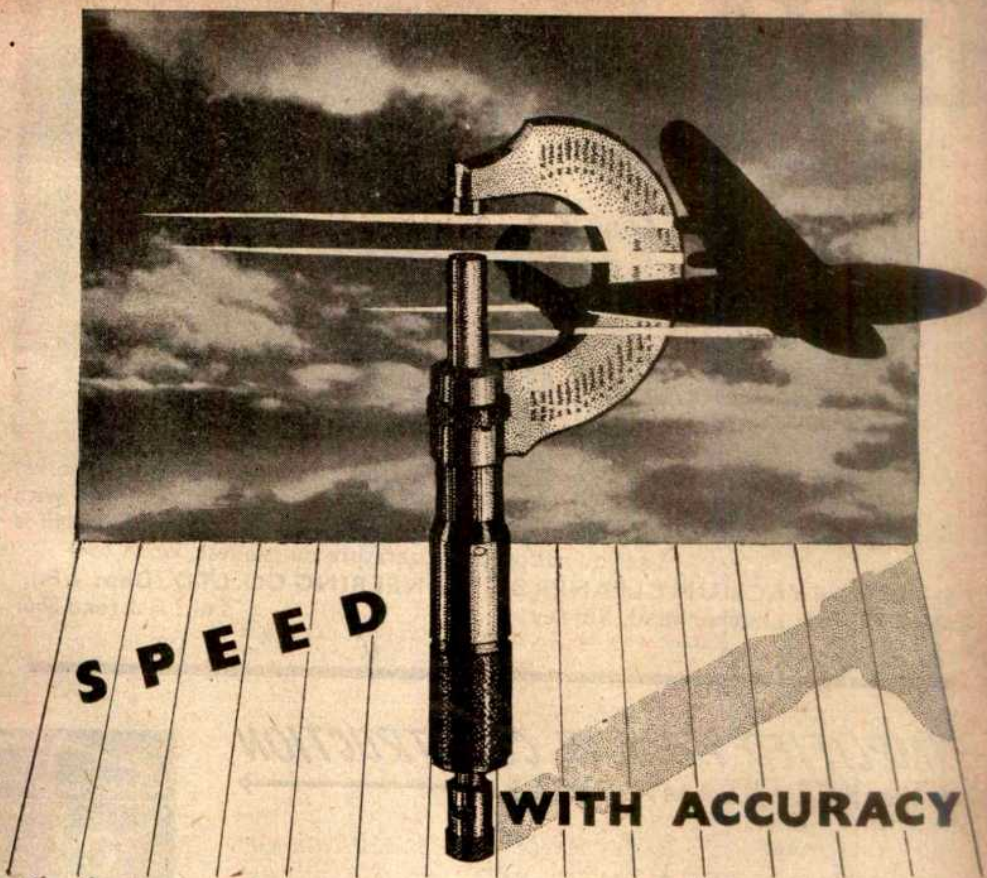
*Fully explanatory literature with helpful illustrations will gladly be sent on request. Why not write **TO-DAY?***

ARDENTE ACOUSTIC LABORATORIES LTD.

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Phone: MAYfair 1380



GUILDFORD, SURREY.
Phone: Guildford 3278/9



Must we only gain speed at the expense of accuracy? That often happens with hand-posted accounts, where faster working leads to more mistakes. It need do so no longer. The new **VISIBLE** ledger marks a turning-point in book-keeping methods, giving at once quicker posting and greater accuracy.

At every opening of the ledger the headings of thirty accounts are seen at a glance, and any account may be located in a few seconds. In addition to serving as a self-contained index, the "visible edges" show credit limits,

outstanding accounts, and other important information. Think of the time this saves in posting and referring to the ledger.

But quick posting must be accurate posting. By using the Kalamazoo Posting Slip with the **VISIBLE** ledger, a progressive check is kept on the accuracy of the posting, balances are proved as the work goes on, and no laborious cross-checking is necessary.

The possibilities of this new ledger are well worth investigating. Your local branch will be pleased to arrange a demonstration.

Kalamazoo

For Accounts and Records

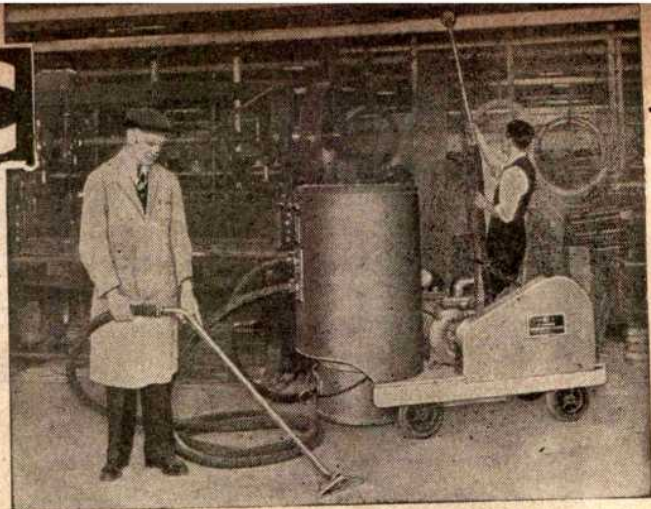
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AN ANNOUNCEMENT OF Kalamazoo Ltd., NORTHFIELD, BIRMINGHAM, ENGLAND

B.V.C.

INDUSTRIAL PORTABLE VACUUM CLEANERS

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factory showing two oper-
ators at work.*



We are specialists in Dust Control Systems for Works, Factories and Business Premises. Let us help you with your dust problem—the advice of our Technical Staff is at your disposal. Literature on request, write to—

The BRITISH VACUUM CLEANER & ENGINEERING CO. LTD. (Dept. I/F.),
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SIMPLIFIED TUBULAR CONSTRUCTION by The KEE-KLAMP SYSTEM

YOU CAN MAKE . . . HAND RAILS FOR BUILDINGS OF ALL DESCRIPTIONS • GUARD RAILS ROUND EVERY CONCEIVABLE OBJECT OR MACHINE • RACKS OF ALL KINDS INCLUDING TYRE RACKS • BENCHES • JIGS • TABLES FOR WELDING ASSEMBLY OR EQUIPMENT • TROLLEYS • INSPECTION AND REPAIR PLATFORMS • TOWERS • STAGING • HANGARS • SHEDS AND RUNWAYS, ETC. . . THE USES ARE ENDLESS.

No matter how complicated the structure may be, you can erect it by the KEE-KLAMP SYSTEM, which is Rigid yet Adaptable, Fixed yet Mobile, Simple yet Complex and Capable of Infinite Variation.

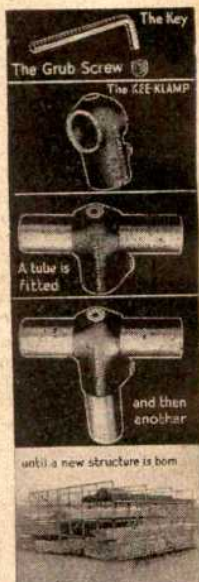
To solve constructional problems which in the past have involved the use of angle irons, plates, left and right hand threading and galvanizing after complete construction, we invite you to seek our aid. We believe we can find the correct answers.

Write to the address below for full details:

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(9a Dept.) GASCOIGNE HOUSE, BERKELEY AVENUE, READING.

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The evidence of its success is in its installations — not only its strong rooms, constructed for banks and national corporations, but equally its range of fire resisting equipment produced for commercial houses, drawing offices and stores.

Wherever there are valuables and documents to be protected, there the integrity of the name *Chatwood* offers reassurance.

Chatwood strongrooms and Chatwood fire and burglar resisting equipment are found in the leading Banks and Business Houses in this country and abroad.

THE CHATWOOD SAFE & ENGINEERING CO. LTD.
SHREWSBURY

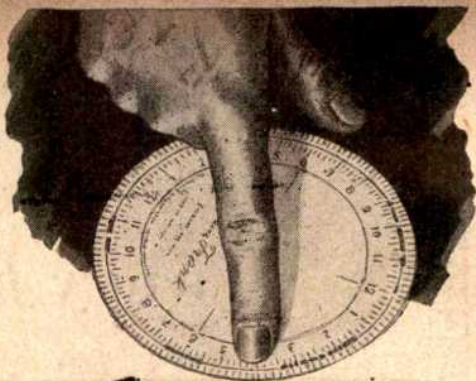


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**UTILICON
PULP PACKS**

... because these modern containers are
moulded to protect valuable products...
are light... strong... and have definite
sales appeal.

UNIVERSAL PULP CONTAINERS LTD
MILTON OF CAMPSIE near GLASGOW



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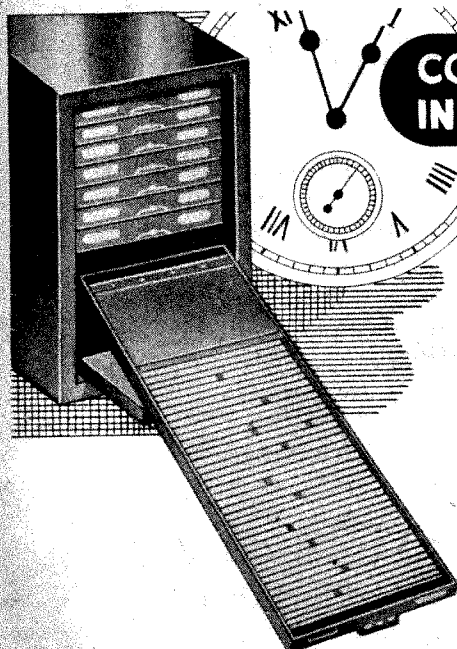
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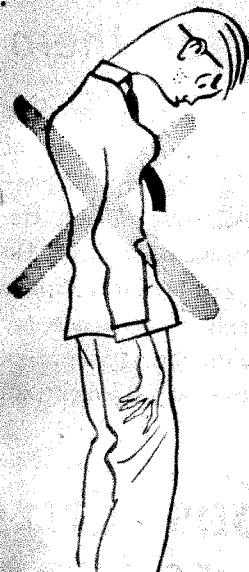
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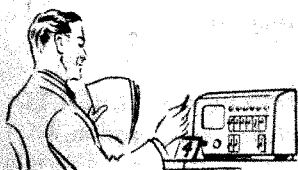
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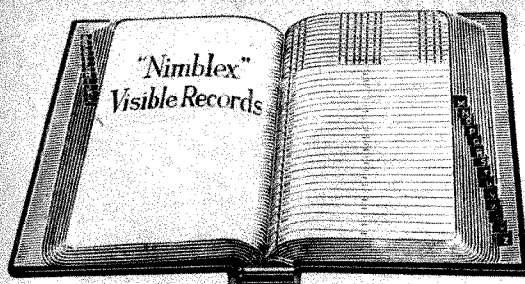
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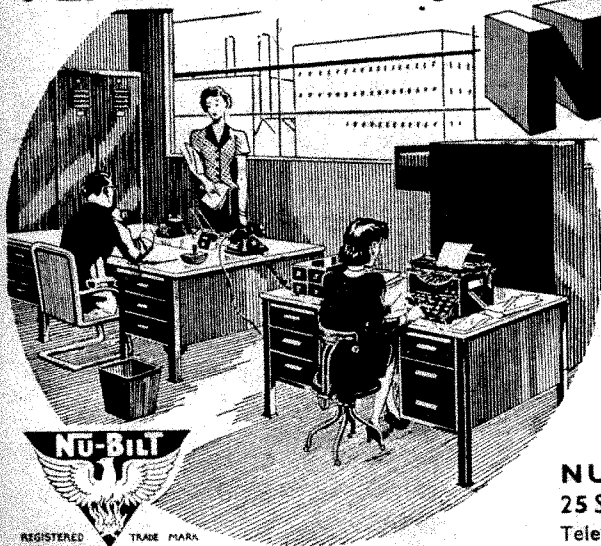
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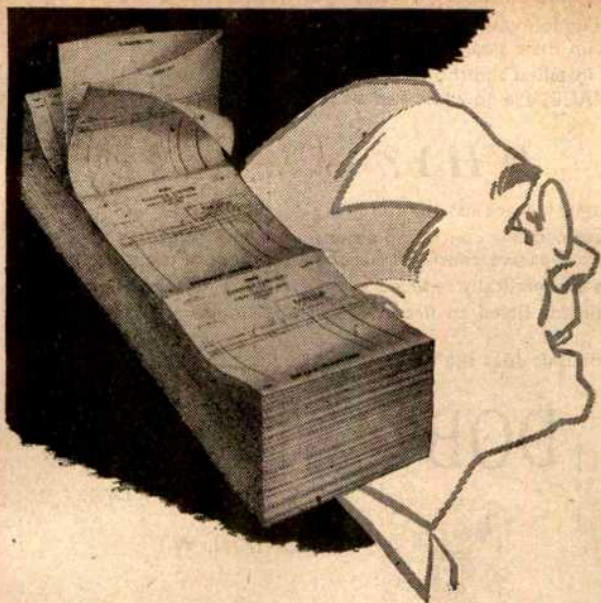
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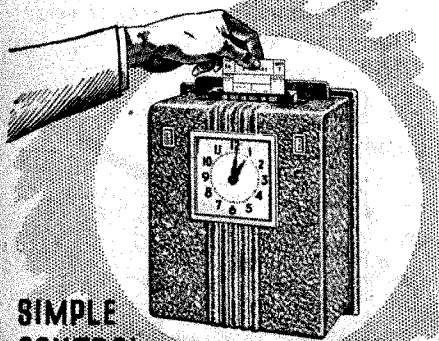
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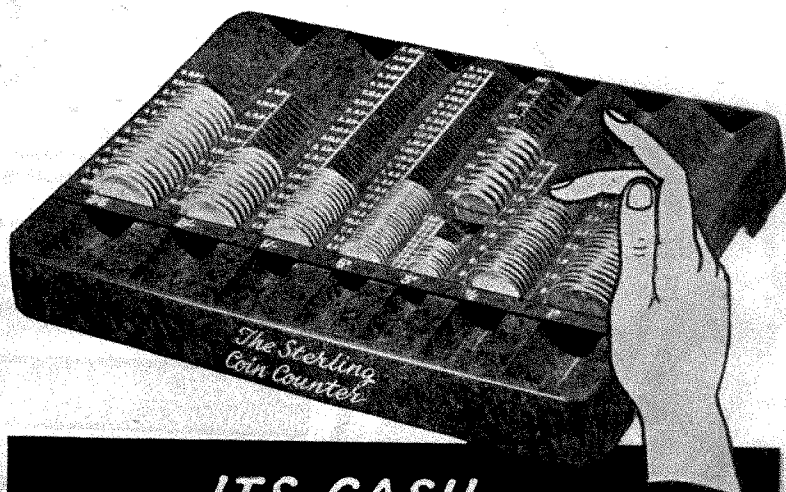
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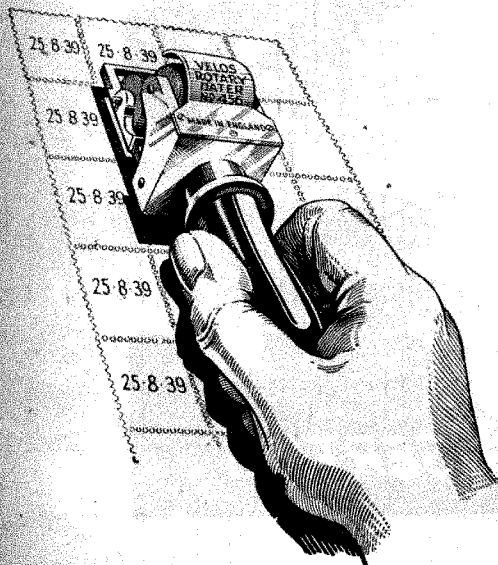
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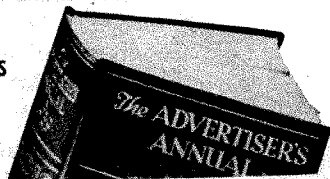
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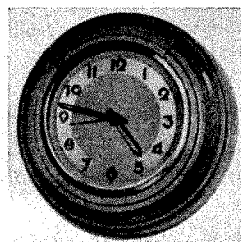
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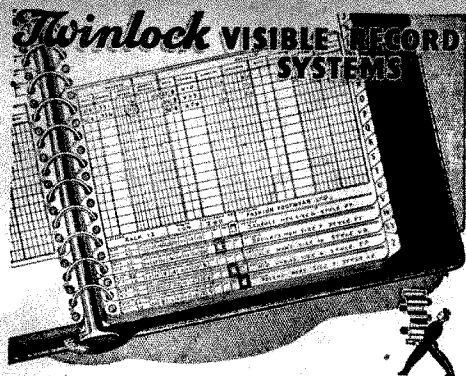
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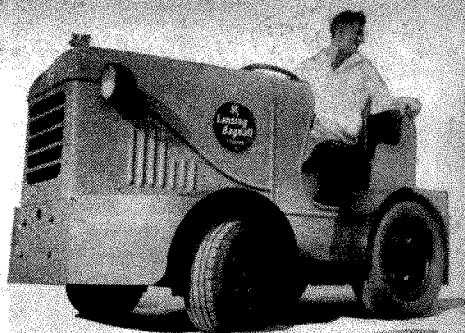
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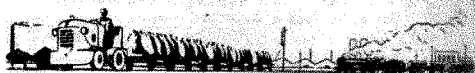
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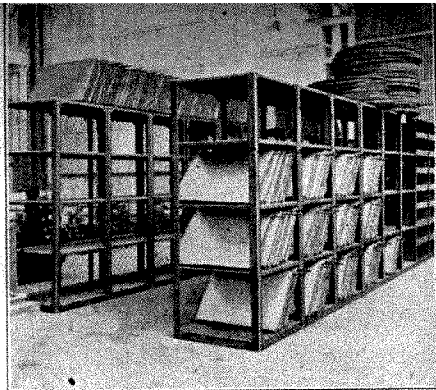


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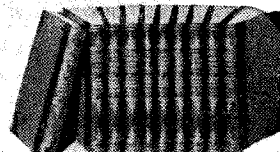
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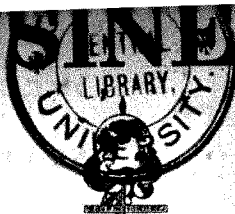
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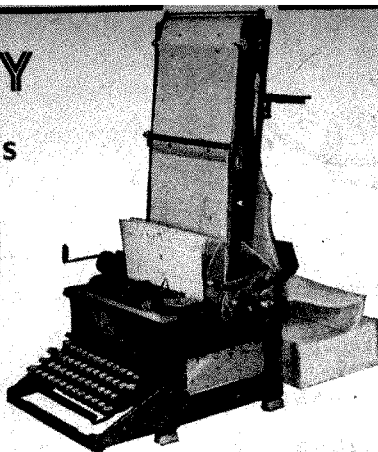
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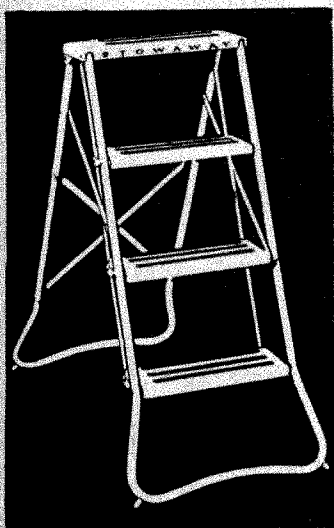
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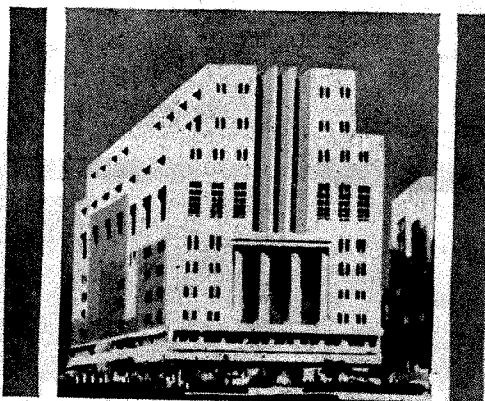
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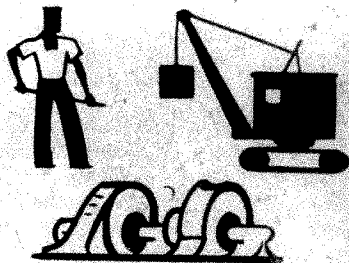
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British Industry

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MORE H.P.

Says E. R. WILKINSON, M.I.E.E.,

Commercial Manager, Central Electricity Board

In an Interview with THE EDITOR

IN 1944 the United States outproduced the Axis powers in combat munitions by more than 50 per cent., made over 40 per cent. of total armament output of all belligerent nations. U.S. achievement was made possible by adding 25 billion dollars to pre-war plant investment and by keeping productivity high. Besides performing its war job, industry kept the American standard of living close to pre-war level. With prices expressed in 1939 dollars, consumers spent for goods and services approximately 60.7 billion dollars in 1941, 68.3 billion in 1944.

In these words are summarized an audit of American war-time production which appeared in the January, 1946, issue of the magazine *Fortune*. They are big words, even bigger figures. But there is no reason to doubt their validity. The point for British industrialists is contained in the second sentence. "U.S. achievement was made possible by adding 25 billion dollars to pre-war plant investment and by keeping productivity high." Clearly the author of the article believes the phenomenal American productivity during the war years resulted more or less directly from the amount of money invested in plant.

Of itself the figure of 25 billion dollars has not much significance, even for American readers. When associated with P.M.H. index figures, however, it begins to have some meaning. The P.M.H. index for airframes, for example, rose from 100 in 1941 to 344 in 1945. In the production of Liberty ships it rose from 100 in 1941 to approximately 225 in 1943. Of course these rises in productivity were accounted for by the use of mass production, and new techniques, methods and materials, as well as by the introduction of new machines. But our concern today is chiefly with new machines.

It is extraordinarily difficult to obtain figures for Britain which will relate manpower, machines, and production. The amount installed in the way of capital equipment in 1938 can be ascertained, but there are no production figures for that year. The last Census of Production took place in 1935, and even then no information was collected as to the horse-power equipment of industry. For that, one has to go as far back as 1930. Government departments and associations of industrialists, etc. are anxious to help, but cannot. They simply have not got the inform-

ation. Like the production drive itself, therefore, the decision to discuss the possibility of an annual Census of Production came in the nick of time.

As far as we have been able to discover, there has been only one recent attempt to discover what is required of British productivity if the gap between our pre-war and post-war incomes and expenditures is to be bridged. It was made by Mr. E. R. Wilkinson, President of the Association of Supervising Electrical Engineers and Commercial Manager to the Central Electricity Board. Mr. Wilkinson has given me his views in an interview. I believe they are of the deepest significance to all industrialists.

It is impracticable to do more than indicate in general outline the magnitude of our problem, said Mr. Wilkinson. Figure 2 contrasts our pre-war position with that which would arise if we maintain our pre-war standard of living, incur the necessary expenditure to overtake the arrears of maintenance replacement and new capital and re-equip our industries on a five-year programme, and deal with the transport, housing and other deficiencies of our community life on a 20-year programme.

The Problem Stated

The 1938 position is re-capitulated on the left-hand side of the figure in three columns. The main items of expenditure on current consumption, maintenance and replacement of existing assets, creation of new capital assets, and defence are shown in the extreme left-hand column. The middle column shows the extent to which those commitments were met by imports and from other resources. The right-hand 1938 column shows that our shipping and foreign investment income, together with our exports, were insufficient to cover our import requirements by an amount which represented 1.3 per cent. deficiency in the production and services of our working population. This small deficiency was not particularly serious, since the pre-war balance of net investment or disinvestment abroad was in some years favourable and sometimes unfavourable. The situation in 1938 was probably affected to a small extent by our re-armament requirements.

Turning now to our post-war position, and considering it in terms of 1938 values, the left-hand column shows first our requirements for current consumption on the pre-war standard of living but on a full employment basis; the upper portion of the bottom block indicates the additional consumption goods necessary to overtake in a five-year period the arrears of the war in more durable consumption goods and the replenish-

ment of trading stocks. Similarly, the block above shows the normal maintenance and replacement of existing capital assets and the arrears of deferred maintenance if carried out on a five year programme. Above that again is shown the normal pre-war rate of new capital formation, the overtaking of the wartime arrears, and the re-equipment of industry on a five year programme, and the deficiencies in our community requirements on a 20 year programme. Above that again is shown our requirements for defence.

The middle column shows the extent to which we will need to import and the proportion of our requirements which must be met from our own resources. At the top of the extreme right-hand column is shown the exports and shipping income necessary to balance our import account, and finally the column also shows the production of goods and services other than those for export, which would result with full employment and if standards of productivity and hours of work are at the pre-war level. It will be seen that on such assumptions there is a deficiency of no less than 32.4 per cent.

Since it is impossible at this stage to say exactly when the necessary expenditure will actually be incurred, the right-hand columns do not represent any particular post-war year and cannot lay claims to strict accuracy. The purpose is to show that unless a very substantial increase in our national productivity is secured, our current consumption, our capital commitments, or our imports, or all of these, will have to go short, and the gap is so great that any discrepancies in the figures cannot appreciably effect the gravity of the situation.

The Answer Given

How, then, is the problem to be solved? This is not a case in which time is on our side. It is true that by going cap in hand to the United States and to Canada, we may be able to purchase two or three years of time at the expense of an added burden to the future, but that appears to be the limit, and thereafter our problems will increase rather than diminish. Look at figure 1, which shows the best available estimates of our future population. The left-hand panel shows that while up to 1960 our total population will be more or less stationery round about 47 millions, the proportion of working age is contracting and the age groups of maximum productivity are contracting more rapidly still.

The centre panel shows the deductions which have to be made from the total population in the working age groups to arrive at the population actually at work—a working

population of roughly 19 millions in 1948, falling to 18 millions by 1960. The right-hand panel attempts to analyse the population actually at work, and shows that after deducting the various services, the population available for the actual manufacturing industries is only some eight millions, falling to some seven millions by 1960.

The problem which confronts the manufacturing industries, therefore, is to sustain the life of the community and to bridge the gap between our pre-war production and our post-war requirements with a labour force which is likely after the first few years to show a steady and appreciable decline. How is this to be done?

The answer, of course, must lie in the securing of a major increase in productivity per worker. If the gap in our overall production and services is likely to be anything of the order of the 32.4 per cent. shown in figure 2, then, since no large scale increase in productivity can be looked for in the services group of occupations, the increase in productivity required in the manufacturing group is at least of the order of 40 per cent.

In every department in every factory in every industry, therefore, a detailed investigation should be carried out in order to ensure that increased electrification shall be

substituted for manual labour wherever even a small gain in efficiency and productivity can be achieved. Administrative work which is not directly productive should be carried on with the minimum manpower necessary.

Further economies are doubtless possible by a close scrutiny of such technical problems as quality control, the utilisation of waste products and the planning of the flow of materials through the factory and of interlocking industrial processes. But if our past history is any guide, the contribution which such efforts can make by themselves is relatively small.

Figure 4, based upon the results of the pre-war Board of Trade Censuses of Production, shows that the increase of 37.5 per cent. in productivity per worker which was secured between 1924 and 1935, was accompanied by an increase in the electrical and mechanical energy consumption per worker amounting to roughly 35 per cent. The difference of 1.5 per cent., of course, does not give any true indication of the contribution of management and planning to the increase in productivity. Management and planning were responsible for the provision of the additional horse-power which enabled the increased productivity per worker to be obtained.

The great strides which are shown in figure

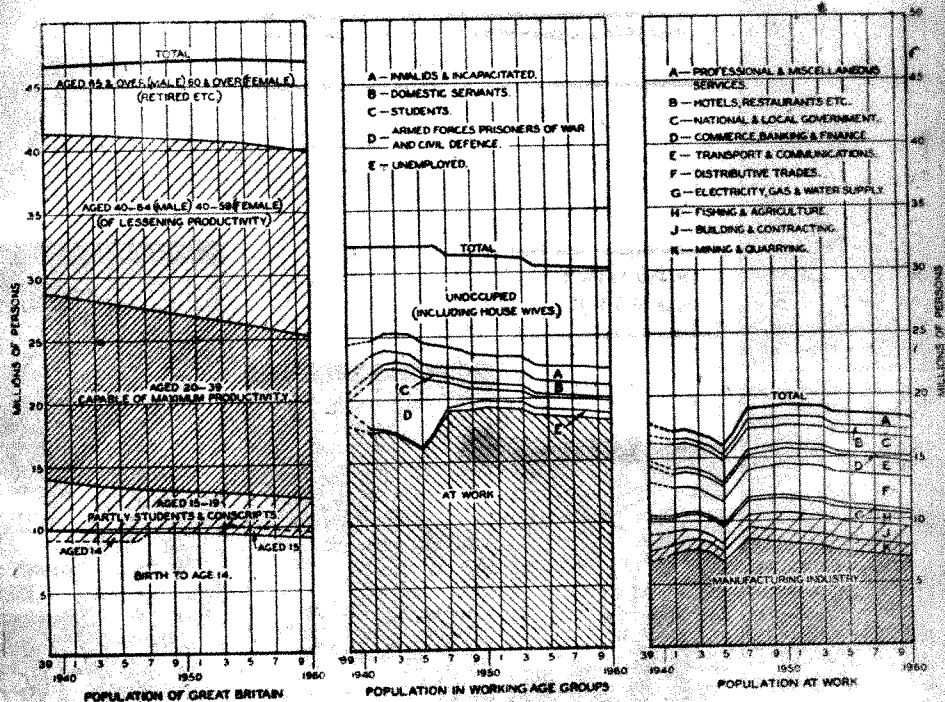


Fig. 1. By 1960 the total population will be stationary at 47 millions; the numbers available for manufacturing industries only 8 millions

British Industry must almost double H.P. capacity

**HORSE
POWER
PER
OPERATIVE**

7

Look at this gap. 1940 projected figure reveals British worker

6

In 10 years, Britain added a mere 45 H.P.

5

Post 1914 war showed better motorisation record
7 H.P. in 10 years

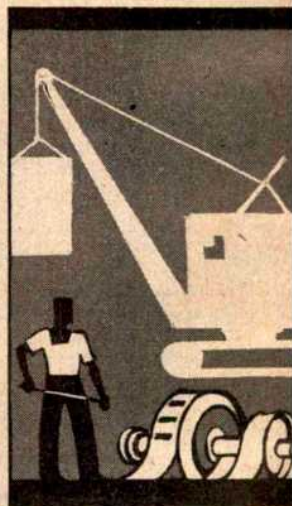
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3

1910-20 saw a
rise of 5 H.P.

2

1



1910

1920

1930

to compete with U.S. Output efficiency

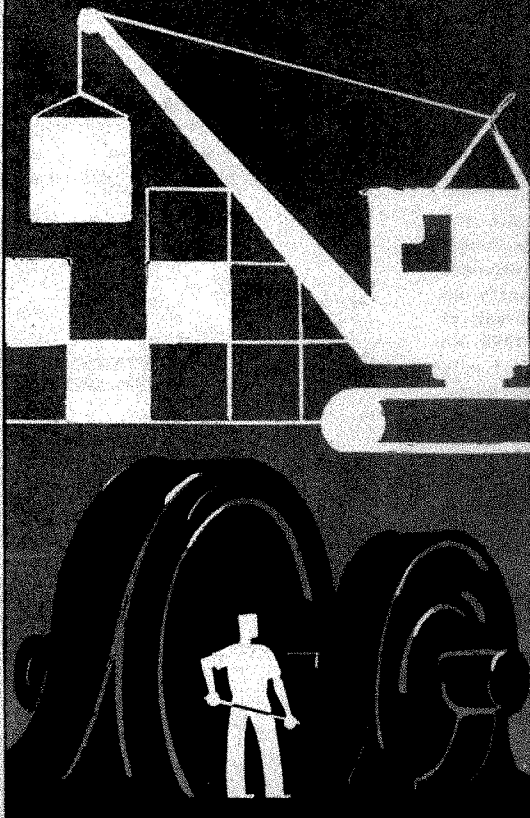
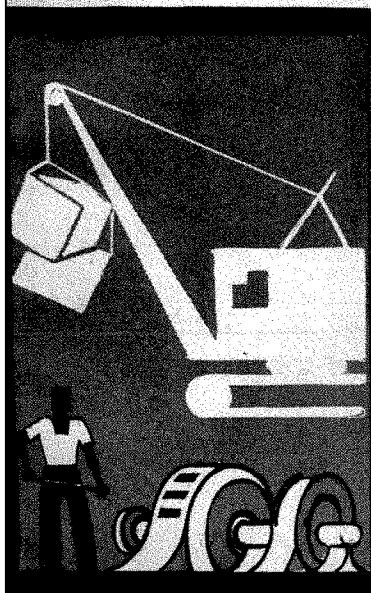
with only € 3.25 H.P. at call

By American standards, we need 13 million horse-power over and above the pre-war total, an overall total of 25 million horse-power in the factory trades alone, if we are to :

Maintain our pre-war standard of living

Incur the necessary expenditure to overtake the arrears of maintenance replacement and new capital and re-equip our industries in a five year programme.

Deal with the transport, housing and other deficiencies of our community life on a 20 year programme.



In 1947 every American worker will have 7 H.P. at his command

1940

Fig. 2 contrasts our pre-war and post-war positions, and reveals a 32.4 per cent deficiency in total production services now, at 1938 productivity and hours of work. Unless this is made good, our current consumption, our capital commitments, or our imports, or all of these, will have to go short

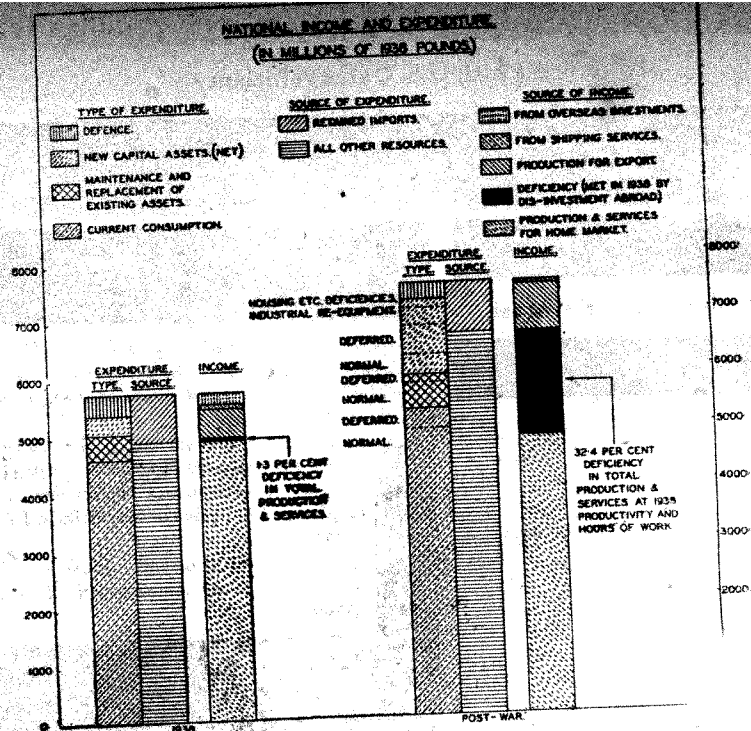
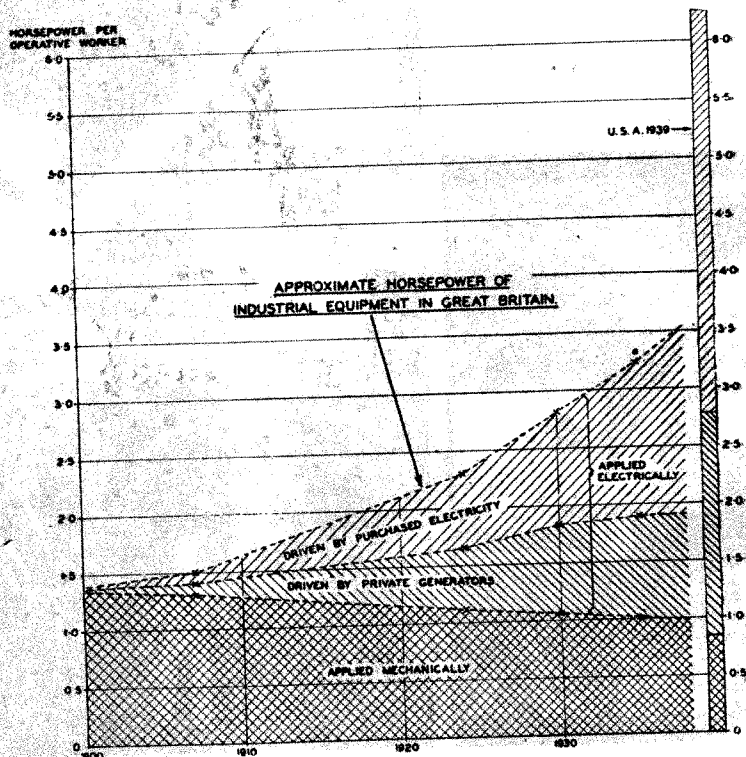


Fig. 3 shows the approximate horse-power equipment in this country up to the outbreak of war. In 1939 we had a total of only just over 3½ horse-power per worker, while the U.S. figure was nearly 6½. Next year the U.S. will have 7 horse-power per man



At least the approximate horse-power equipment in this country up to the outbreak of war, will show that throughout the period dealt with there has been a natural and steady decline in the amount of horse-power applied mechanically. Up to about 1930, the horse-power of motors driven by private generators was expanding almost as rapidly as that driven by purchased electricity, but thereafter private generation has remained almost stationary, while the requirements fed from public supply sources have continued to expand at a rapid pace.

U.S. Comparisons—A Warning

So far as the munition industries are concerned, of course, this expansion was continued during the war period, but the process of electrification has been suspended almost entirely in the case of the normal peacetime industries which had to contract their volume of employment during the war period. At the right-hand side of the figure, comparable figures for the United States of America in 1939 are given. They show that whereas in this country we had a total of only just over $3\frac{1}{2}$ horse-power per worker, the U.S. figure was nearly $6\frac{1}{2}$, and a recent survey covering a large number of firms in the United States indicates that by next year it is probable that the United States will have an average of no less than 7 horse-power per man at the disposal of her workpeople.

A general comparison of this nature may be misleading. There is in America a large proportion of industries such as the timber, wood pulp and electro-chemical trades which have been established there because of the existence of large supplies of low-cost water power. If the comparison is made trade by trade, it is found that in point of fact the textile industries, for instance, are not so badly off in this country relative to America as are some other industries.

But by applying the 1939 American scale of equipment to each of the comparable industries in this country on our probable scale of post-war employment we can attain at least an approximation of our own needs. On that basis a total of something like 13 million horse-power must be installed in our industries over and above the pre-war total before we approach the 1939 American scale of utilisation in comparable industries.

An overall total of something like 25 million horse-power of electric motors is required in the factory trades of this country alone, apart altogether from the requirements of the extractive industries, before the American scale of utilisation in comparable industries is approached.

"Do not let me be misunderstood," Mr.

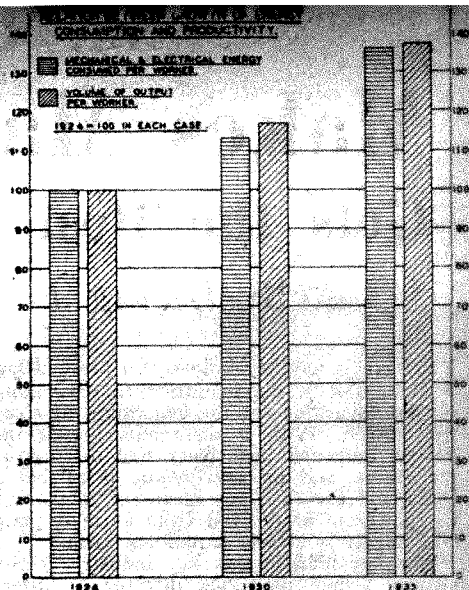


Fig. 4 has been based on pre-war B.O.T. Production Censuses. It reveals output growing as motorisation increased

Wilkinson concluded. "I am not advocating horse-power merely for the sake of horse-power. Every industrialist knows that it is the price and quality of his product which determine the quantity sold and not the design, layout or equipment of his factory, which in fact are only the means to the end and are not in themselves the end.

"But what I do suggest is that in the majority of our industries we are a very long way from that limit, and that the changes which have taken place in the costs of labour, raw materials and fuel, have so radically altered any pre-war basis of comparison that there is a need for a complete re-examination of most of our industrial processes in the endeavour to secure increased electrification wherever even a fractional gain in cost efficiency can be obtained thereby.

"Let me say also that the problem is not an insoluble one. There is no inherent reason why the necessary standard of electrification should not be attained. Indeed, had the pre-war rate of increase been maintained the equipment now seen to be immediately necessary would probably have been installed by about 1960. The crux of our problem is not so much its size as the time factor—the urgency of the task of completing it in the shortest possible space of time in order that our standard of living may not be impaired and that we may take our old place in the comity of nations."

Sir George Makes Machines and Gets the Best from His Team

By Giving Each a Free Hand

IF there is any key industry in present-day Britain it is the manufacture of steam-raising apparatus for the generation of electric power. With a disorganised coal industry, admitted inefficiency and discord in the mines, and an uneconomic price¹ being demanded for coal, any means of increasing the power to be derived from an inadequate coal supply is clearly a national asset.

The key man in this key industry is Sir George Usher, managing director of International Combustion Limited. As most readers know, this company's main business is the designing and manufacturing of plant for raising steam by the economical use of low-grade fuels. In addition to the manufacturing of all types of mechanical stokers and machinery for the pulverisation of coal and other minerals, it has a still broader connection with the coal industry through the manufacture of coal mining machinery.

Therefore Sir George Usher ought to, and does, have as widespread a knowledge of the industrial problems connected with coal and its relation to every phase of British industry as any man who could be readily named. Nearly every modern power plant in Great Britain, and a great many others all over the world, uses machinery manufactured by Sir George's company. Electric power has come to be such an essential factor in British industry that, as he says, anything which hampers its cheap and efficient production is a direct blow to every trade, whether domestic or export.

Sir George got his business training the hard way. His parents sent him to Germany to complete his education and learn the language, but he soon got tired of that. Getting a job with a German company which even then was exploiting means of using Germany's low-grade fuel, of which that country has a great abundance, he learned everything that was known at the time about fuel efficiency. Those were the days when Germans worked with the same furious energy along productive lines that they were later to switch to destruction, and young Usher thus early acquired the habit of hard work which has since characterised him.

After his German experience he went to the United States to become general manager of the Green Fuel Economiser Company, finally returning to England in 1923. He then became associated with the founding of

International Combustion Limited, which has now grown to a great organisation incorporating half a dozen earlier companies, as well as various subsidiaries abroad.

Like many industrialists who have made a great success of their own businesses and have won the co-operation of their own associates and work-people while doing it, Sir George has no faith in the alleged virtues of nationalisation. Having built up his business in the face of tough competition from American and German interests, and having had to face and work with economic law all over the world, he finds it impossible to believe that doctrinaire theories can be imposed on British industries from above with any hope of success.

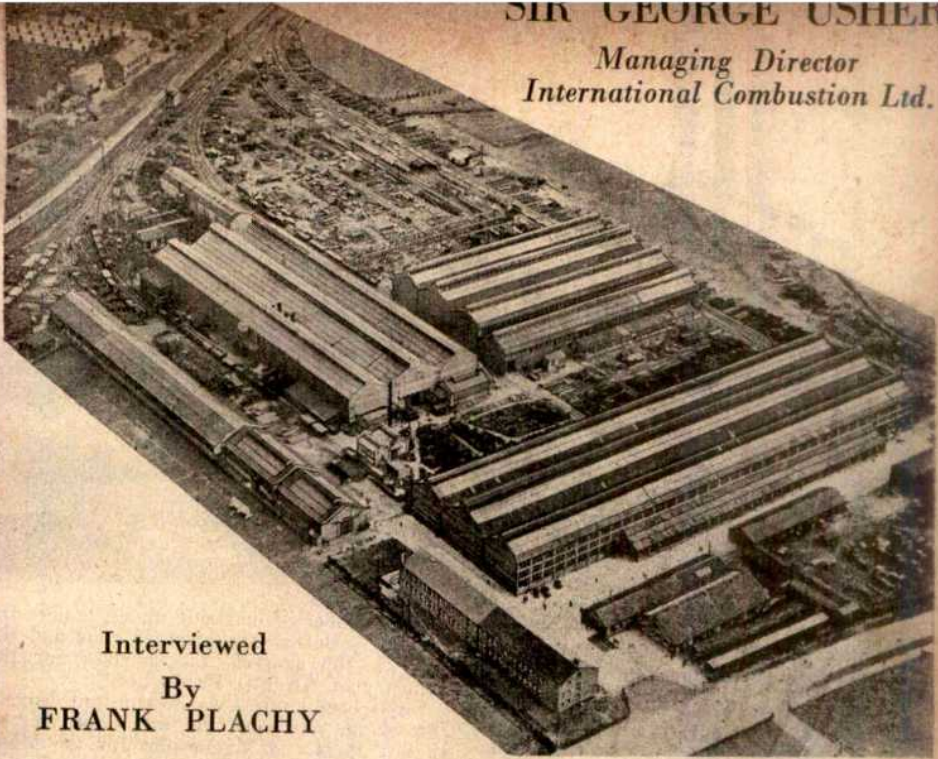
"I would like to ask Mr. Shinwell what he is going to accomplish by nationalisation," says Sir George, "It takes more than two tons of coal to make a ton of steel. If you can't produce steel cheaply because of 'slackness' in the mines, how are you going to pay engineers a living wage in competition with the United States?"

"We shall all find out that it can't be done. Higher money wages will inevitably result in lower real wages if nothing is done to get costs down. I would like to ask the politicians where we will be in a buyers' market. It won't be a question of a higher standard of living—it will be a question whether we can retain even our pre-war standard of living.

Work—not Talk Produces Goods

"Few people realise how vital to our survival as an industrial nation is the need for cheaper costs in our coal and our iron and steel industry. Politics can't reduce industrial costs, but harder work and better equipment can. How many people know that if the dollar was free of exchange restrictions the Americans could land coal here at a much lower price than our own production costs?"

Sir George follows the fortunes and misfortunes of the coal mining industry with close attention, especially the South Wales section of it. Concerning production in this field he says: "I firmly believe that if 5,000 willing workers were added to the present force of the South Wales steam coal raising industry coal costs could be reduced by three to four shillings per ton without the



SIR GEORGE USHER

Managing Director
International Combustion Ltd.

Interviewed
By
FRANK PLACHY

addition of any further capital equipment and without any diminution of profit.

"You can approach our national problems from any angle you desire. You can discuss them in terms of a class struggle, if you can get anyone to believe you in these days of strangling taxation. You can believe that politicians are better equipped to restore our industrial position in the world than the experienced men who have always done it before. You can follow any will o' the wisp that you like. But in the end you will come back to the hard fact that more production, more goods, more hard work, are the only remedies."

No man has done more to call the attention of British industry to the importance of P.M.H. than Sir George Usher. His own industry is one in which production can be measured with a high degree of accuracy. Efficiency in fuel consumption can also be accurately measured. In both fields Britain comes off badly.

In many cases American P.M.H. is as much as 40 to 50 per cent. higher than in Britain. This is largely due, in Sir George's opinion, to the fact that British manufacturers still lag behind their American competitors in taking full advantage of known modern production methods. He believes the British worker would do his share if British manufacturers would take every possible step to facilitate rapid production by the elimination of what is now generally accepted as unnecessary manual labour.

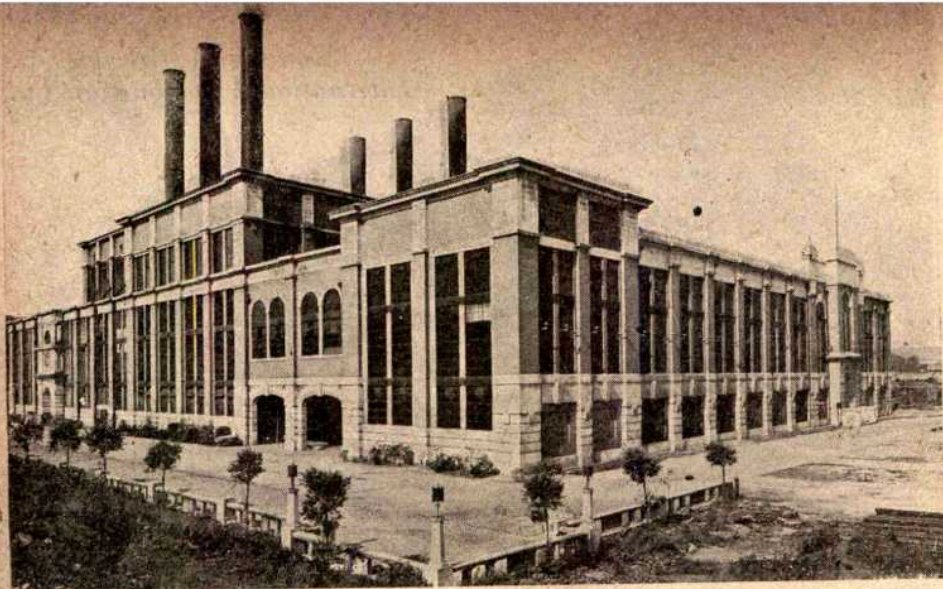
The great Derby works of International Combustion Limited is only one of Sir George Usher's many interests

He points out that British workers who have emigrated to the United States match the American standard of production and believes there is a need to reconcile psychological differences.

As to the prospect for improved output by British industry as a result of recent official speeches, Sir George says: "Most industrialists will welcome the recent appeal by Mr. Attlee for increased production and the T.U.C.'s half-hearted endorsement of it. Let us hope that these pious sentiments will be translated into fact, although the 40 hour week won't regain our prosperity for us, as so smugly anticipated by our 'planners.'" He is a strong believer in the arguments and figures published by Lewis C. Ord, and has been instrumental in providing a wide audience for that writer's thesis amongst British industrialists.

An interesting point raised by Sir George is that E.P.T. works as a disguised export subsidy for American manufacturers. The different systems of taxation in Britain and the U.S.A. certainly give weight to this contention.

The great success of Sir George Usher's company invites inquiry as to its method of operation and administration. It is remarkably free from any stereotyped form of organisation. The Company's policy is to



Just pre-war. The Power Station at Kirkstall, Leeds, was equipped by International Combustion Limited

find the best man to run each of its various activities and give him a free hand to go ahead, so that departments are almost autonomous. In most comparable organisations there would be a general sales manager: International Combustion has none. Sir George and his general manager run the business together and there is a free and easy understanding that any employee may come to either with a complaint, a suggestion, or for any other reasonable purpose.

Sir George hasn't allowed the close interest he takes in International Combustion and its almost uninterrupted prosperity to blind him to less prosperous situations. He was the first industrialist to establish a works in South Wales at the height of the depression. This was Aberdare Cables Limited, makers of paper insulated cables for the electrical and mining industries, and when it was started 90 per cent. of the workers in its neighbourhood were unemployed. Today Aberdare Cables have 600 employees and its products are sold in nearly every country in the world. Sir George says he knew nothing about making cables at the time, and doesn't know today, but he found a man who did.

This successful experiment was followed by another Usher company, called South Wales Switchgear Limited. This is manufacturing industrial switchgear, electrical transformers, etc., and employs 800 workers.

The war record of International Combustion is an impressive one, but until now no record of it could be made public. The company started to make paravanes for the Admiralty as early as 1938. It went all out on war production when the war began, made

a vast number of magnetic mines, boilers for corvettes, Bofors anti-aircraft guns and the first of the 4,000-lb. blockbusters for the Ministry of Aircraft Production.

Sir George himself was in constant demand for official war jobs. He was Controller of Light Alloys and Magnesium for the Ministry of Aircraft Production and later Director-General of Material Production for the same Ministry. He was also at one time Director-General of Tank Supply and was in the United States and Canada in 1942 as a member of the British Tank Mission.

It is not surprising to learn that International Combustion now has its order book filled for more than five years ahead. Of these orders 40 per cent. are for export and indications are that the export proportion will increase from now on.

The faith in mechanisation which has been demonstrated so abundantly by Sir George in industry is carried into his hobby with equally impressive results. He owns and farms 760 acres in Berkshire, where he has installed electric power to take the hard work out of farming. In spite of its expensive mechanical equipment he is a firm believer that this is the way farming must be developed in this country if it is to be an economic proposition in the future.

He also believes that agriculture must be regarded as an industry capable of competing with any other industry from the point of view of good wages for the workers and modern housing, comparable with urban dwellings, and he has provided these.

As proof of his theory that mechanised agriculture combined with stockbreeding is an efficient proposition, Sir George points to the championship which was awarded to him by the Shorthorn Society as exhibitor of the best bull at the Reading livestock show.

90 % Switchover Within Six Months

*In an Interview George Inglis of Lines Bros. Ltd.
Paints The Transformation Scene*

MANY firms have faced gargantuan tasks in their switchover. The weapons of war and the products of peace were absolutely dissimilar, but in the course of writing this series of articles on the individual reconversion problems of many firms, I have never felt the change to be so absolute as I did after hearing of Lines

Brothers' fine wartime achievement and seeing their equally brilliant transition plans.

Lines Brothers—their products known everywhere by the famous red triangle and the brand name "Tri-ang"—is the biggest toy making factory in the world. The factory covers an area of over three quarters of a million feet. Until 1939, it had been producing toys for the universal delight of youngsters of every age and clime, but from 1940 until 1945—V.J. Day—not a single toy left the factory.

Reconversion was a job that had to be started from scratch. Three thousand people had to re-adjust their ideas. The manage-

ment's job was to help them do it. It had also to see that the materials and the tools were there so that they could tackle the peacetime job as thoroughly and efficiently as they did that of wartime.

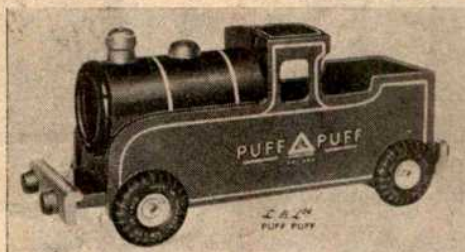
JOHN GILBERT

Elders and youngsters alike knew that toys were scarce because makers all over the country were engaged in no less a serious task but a sterner one—and the biggest toy factory of all was making munitions of war.

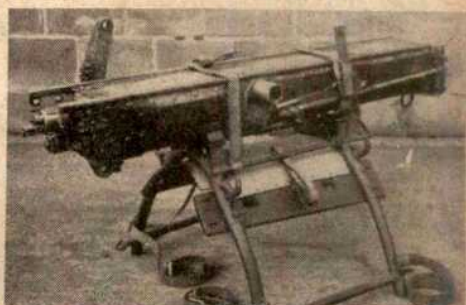
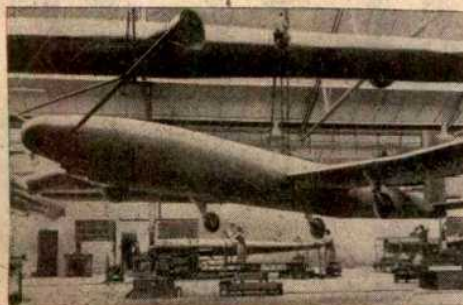
Look at these figures and realise what they would have meant in toy output. This firm made one million Sten machine guns and ten million magazines. They turned out twelve million land mines and untold millions of small shells for air-fighter ammunition. Also rocket projectors, aerial bombs, drop tanks, etc.

For recognition purposes and operational planning, Lines Brothers produced 70,000 scale-model tanks and even more miniature aircraft. More surprising in this mechanical

ENGINES
AND



OF WAR
PEACE



age, they revolutionised pack saddle design for mules and among the individual features of the new saddle, we find tubular lightweight section replacing the old familiar angle-iron structure.

The company's management, technicians and engineers, with a wartime labour force of 7,000 employees, also made and shared in the manufacture of a great deal of scientific equipment, including Radar. And last but by no means least, target gliders about as big as a Spitfire. That is the story in brief catalogue outline of this firm's effort during the war.



As Mr. Inglis said: "You can imagine what our reconversion job was like. We just had to get busy. V.J. Day in August and Christmas so near, did not leave us much time to get even the scantiest quota on to the British market.

"We here, believe there is only one way of doing a job thoroughly and well and that is to get down to it yourself. Our switch-over has been done with and by our own labour and our own effort. By September we were actually producing our first post-war toy, the pre-war Pedalkar. Now our production is only limited by material supply and elbow room.

still to be cleared of wartime impedimenta. Machinery, plant and materials, are cluttering up valuable production and storage space. But even so, at the present moment we are producing as many toys as we did in 1939, although the range is not so broadly selective as it was then or as it will be very shortly."

Continued Mr. Inglis: "We cannot grumble. We are turning out toys faster than they can be taken away and shipped and we are now packing over a hundred cases a day for export. Indeed, the space situation I have just referred to, became so acute that the possibility of cutting down packing of cases had to be considered. So far we have fortunately avoided this and we have been helped here by what appears to be a general easing of the shipping situation."



As I walked around the factory and saw the bright reds, blues and greens and shiny chromium and nickel so attractive to childish eyes, my mind went back twelve short months to the days of drab camouflage. Passing through the huge machine shops, re-tooled to a great extent by this time, and through to the assembly lines, the great change was driven home with even greater force.

THE SHADOW OF THE "STEN" RECEDES AS THE



After all, a machine shop is a machine shop in peace or war. Lathes are lathes and mills and drills just mill and drill; it is the machine tools and the products they produce that make the difference, and the difference becomes apparent at assembly.



From the little miniature clockwork cars and other toys, right up to the large pedal models that a child can drive itself, range a score of production problems. That they had been solved was evident when I learned of the problems confronting the dispatch departments. Huge bays of factory space, as they are cleared of wartime gear and materials, are commandeered

to make room for stacks of packed cases. As I walked around these huge stock-piles, I saw the names of towns and cities throughout the world—the famous and the obscure, Johannesburg, Jerusalem, for away Sydney and equally remote Vancouver. Not forgetting U.S.A., Argentine and Mexico.

Obviously, Lines Brothers have little to learn about the export trade, I thought, and I was right. As Mr. Inglis said: "The Government places no limit on our export of course, but we could do our work a lot easier if we were given a bigger home trade."

The facts about the home quota of toys ought to be more widely publicised. The people—that is, the market—is not unreasonable if it knows why things are scarce. And in respect of the toy trade, not only are the manufacturers finding the quota most irksome, but would-be buyers, whilst knowing that toys are now being made, do not know why their wants remain unsatisfied.

Vaguely they know it is something to do with export. What they do not realise is that from February 1st last, until next July, the British toy manufacturers are permitted to sell only 50 per cent. of the value of the last standard year, that is, 1939. Standard

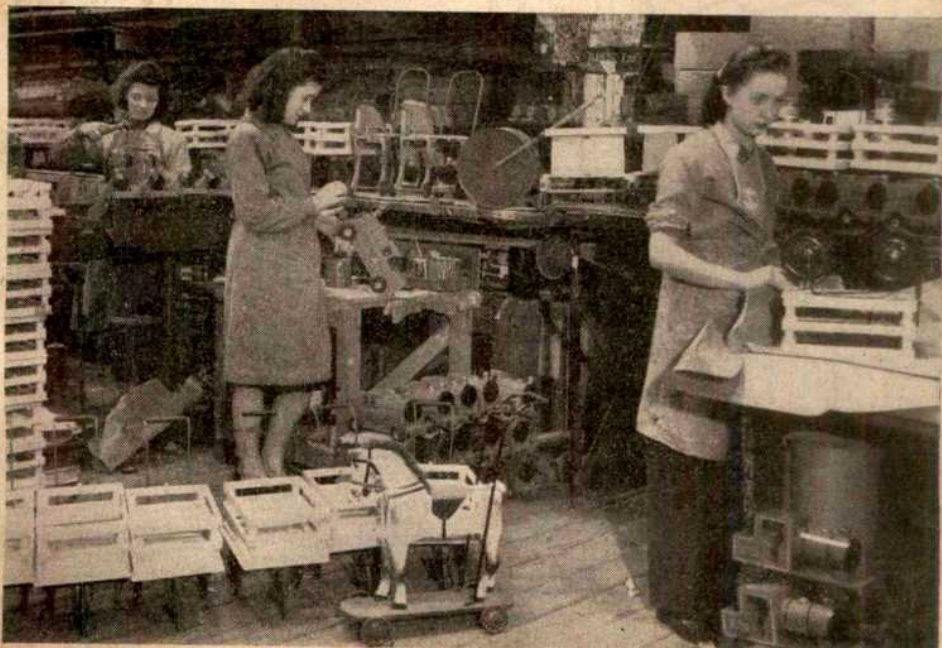


value, that is the operative term; for as goods generally are easily twice the price they were in the standard year, then as far as home trade is concerned, output is less than half in actual goods.

As I continued my tour through the factory, noting the high degree of mechanisation, watching the steadily moving conveyor chains, belts and bands, and knowing from my conversation with the management, that like everyone else the firm had taken to heart valuable lessons in production from wartime's experience, it was

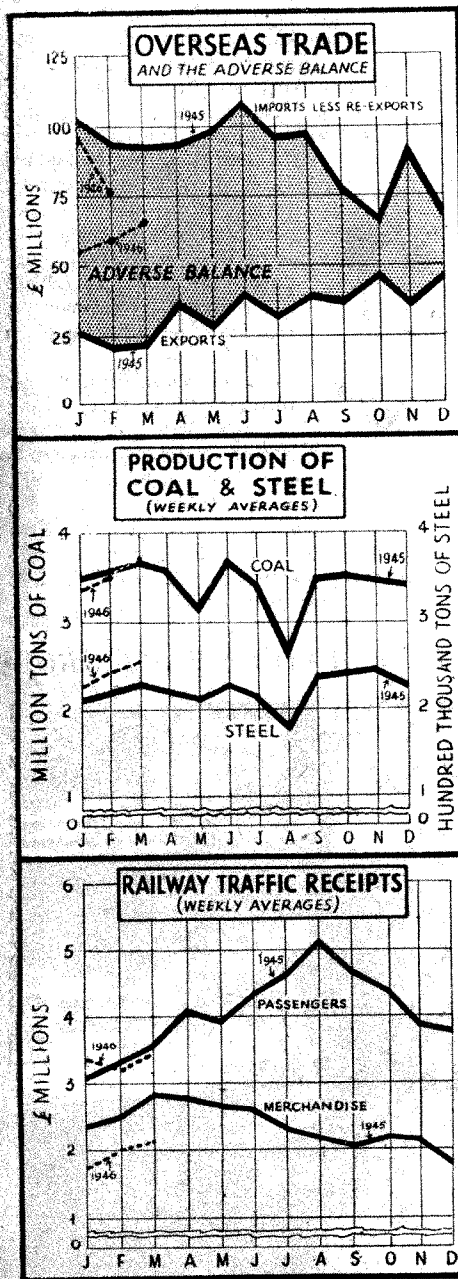
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PRODUCTS OF PEACE FOR HOME AND EXPORT GROW



TREND OF TRADE

By D. C. TERRETT



THE gradual shrinking in the gap between exports and imports makes excellent progress. But a closer analysis of the trends of our foreign trade gives no grounds for complacency.

The export drive requires direction just as much as impetus, and there is reason for believing that our exports are not expanding in the right direction.

The major economic factors in British world trade over the next five to ten years will be the pressure on sterling and a scarcity of dollars. Obviously therefore, a reduction in our adverse trade balance with non-sterling countries is our first and most urgent need.

Our exports over recent months have, however, been expanding most rapidly to sterling countries with the result that the average over the last four months is now some 20 per cent. above the average monthly levels of the four pre-war years, 1935-8, while exports to non-sterling areas over the same periods are well below the pre-war average.

The importance of this trend can be gauged from the fact that the average monthly adverse balance with non-sterling countries over the latest four months' period was £34.7 millions compared with £7.45 millions with sterling countries.

Trade with North America which bulks largely in this total is shown in the following table:—

Average Monthly Figures in £ Millions.

	Imports	Exports	Adv. Balance
1935/8	15.0	4.2	10.8
1945/6 (latest 4 months)	33.6	3.8	29.8

A large part of this difference is due to imports of manufactures from the U.S.A. during our transition period. For example, U.S.A. manufactures accounted for 55 per cent. of the total imports in this class in 1945 compared with only 18 per cent. in 1938.

It is to be hoped now that our own industry is once more getting established on a peace-time basis there will be a reversal in this trend.

STEEL PRODUCTION

Output of steel continues to be most encouraging, and is now at a greater annual rate than in pre-war years. In fact, production figures are already approaching the wartime peaks, with the output for March the best since February, 1944.

Coal production is still seriously inadequate, and the number of wage earners on colliery books remains obstinately below 700,000 compared with 780,000 in 1938.

Output in March just exceeded the figure for March, 1945, by 1½ per cent., but the

Exports Up 20% on Pre-war

Inadequacy of this improvement is shewn by the fact that coal consumption by industry over the same months rose by 11½ per cent. The Government are obviously only too well aware of the situation and their efforts to deal with the shortage of miners and absenteeism will be watched with concern.

RAILWAY RECEIPTS

The decline in railway receipts from merchandise traffic has flattened out in the last three months after the steady decline during the last three quarters of 1945. This is a useful pointer to the smoothness with which industry surmounted the transition period.

Passenger receipts continue at double the pre-war rates, but it would be surprising if the high peaks of last summer were to be reached again this year. More long-distance buses, the basic petrol ration and less call for service travel are all bound to affect the takings of the railways.

RETAIL TRADE

Money is still pouring into the shops and the big stores are reporting record profits, which are not, however, being paid out in record dividends.

Cash sales in Central London are advancing more rapidly than for the country as a whole, thus reflecting the drift back of the population to the metropolis. The average money takings for the last twelve months in Central London were back to the 1937 level, the best pre-war year.

The detailed figures show a continuation in the shop rises in sales in the furnishing and hardware departments, but what is even more encouraging is the marked improvement in stocks in these departments. These are now 26 per cent. and 38 per cent. respectively above the levels of a year ago.

This is the best safeguard against inflation.

WAGES AND PRICES

A moderate amount of inflation is of course inevitable and is apparent in the trend of prices and wage rates.

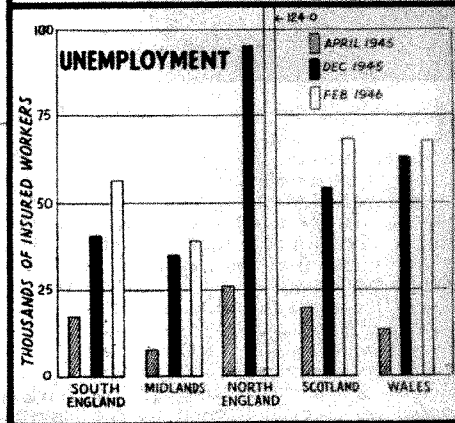
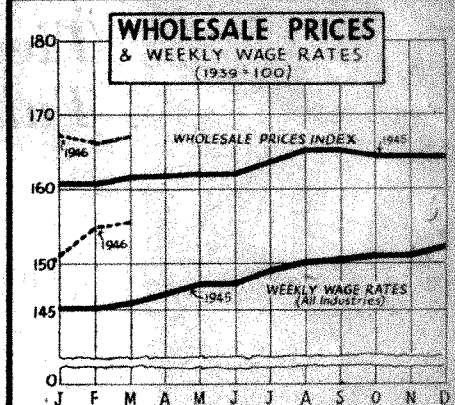
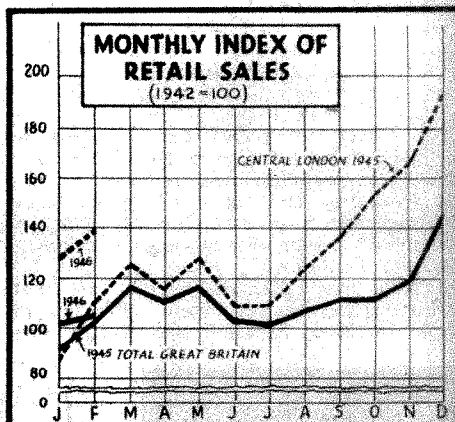
Wholesale prices continue their steady rise.

The price of lead was raised again in April to £45 a ton, the highest price since March, 1920. The supply position is so precarious that it has been found necessary to ration consumption both here and in the U.S.A.

Copper, too, has just been raised to £72 a ton, the highest price for nine years. In this case, the U.S.A., which is the world's largest producer and is normally self-sufficient is having to import at the rate of 30,000-40,000 tons a month.

Wage rates are being revised upwards throughout industry. But it must be borne in mind that this trend only partially offsets the total drop in earnings through shorter hours and cuts in overtime, and although the amount of money in circulation is above the

ECONOMIC CONSULTANT



levels of a year ago, the rate of increase is showing signs of slackening.

The dangers of inflation are much more serious in the U.S.A. than here, the budget deficit in the two countries being £41 10s. and £15 per head of the population respectively.

EMPLOYMENT

The importance of economic trends in the U.S.A. as affecting this country are stressed by the Unemployment Insurance Statutory Committee in its report for 1945, just published as a White Paper.

The Committee points out that "future world depressions may give rise to a larger increase in unemployment in Great Britain than previously" and warns of "the possibility of a recurrence, at a fairly early date, of 'structural' unemployment in certain industries and localities."

It also drew attention to the fact that productive capacity of many industries in North England, Scotland and Wales was

swollen to meet war demands, and that unemployment in these areas now accounts for over 70 per cent. of the total figure for the country.

BANK CLEARINGS

The tendency for the transition difficulties to be longer and more acute in the North is emphasised by the Bank Clearing Returns:

Three cities in	1946 to date	Increase over same period in 1945	
		£	Per Cent.
N. England	£109,230,000	£15,289,000	14
Midlands	£57,476,000	£10,895,000	20

These figures are however, more encouraging than might have been expected and as the Unemployment Committee pointed out, "There is likely to be for some time, an abnormally large demand for capital goods such as machinery, ships, houses, and . . . there are various reasons to expect that the duration of this phase will be longer than after the first world war."



A Man's Output is Tied to What He Takes Home in His Pay Packet

From A Consultant's Case Book
No. 1

By JOHN W. HENDRY,
F.R.Econ.S., F.I.F.M.

MANHOOR output is fundamentally related to take-home wages. Not, it must be emphasised, basic wages. The worker can only be interested in what he receives in his wage packet *net*.

The case I am examining today, revolves round a woodworking factory. During the war years the firm was engaged on sub-contracts for bombers. The wages structure followed the trend prevalent in industry but now, being engaged on the manufacture of price controlled utility furniture this problem has become acute. The workers were conscious of the fact that wages are likely to suffer and for this reason were adopting a go slow policy. There was an active T.U. minority which consisted of the skilled craftsmen, joiners, who because of their

organisation were naturally the most vociferous.

Seventy-five per cent. of the labour is unskilled. The majority of these are new labour, that is, not of long standing with the company and therefore could hardly be expected to have any deep rooted sense of loyalty.

Most of the craftsmen however are of long standing, and because they are craftsmen, and will be required eventually for the post-austerity phase, the firm was reluctant to take any action that might prejudice personnel relationship. Normal time study measurement demonstrated that the efficiency factor, overall, was as low as 55%, that is, another 82% of output per operator would be required before the normal bonus payment could be considered.

Clearly this was a situation that could not be tolerated, yet, in these days of short labour supply, arbitrary methods of disciplining the workers would undoubtedly fail.

Two policies were adopted. (a) Short term. (b) Long term. The short term policy took the form of de-skilling all the operations, in other words taking off all the craftsmen from the production programme and relaying the work-flow to obtain as near as possible the principles of batch production, each batch being related to the types of machining covered.

This enabled a "scrambling" of the rates of operator production to be effected and thus help to avoid comparisons with previous work effort. It should be appreciated that the management were now attempting to enforce a true measure as against the exalted measure of the war years.

The craftsmen, were paid at a much higher base rate than the operators and thus were split into two economies. One section was promoted to chargehands, each responsible for machine setter's functions and also to exercise supervisory duties. Those craftsmen who were temperamentally unsuited for the supervisory ranking were put on to jobs, of which there were very few, where they could exercise their skill. These consisted of "one-off" types of work to special specification. Additionally, because they had all worked the machines, they could be used as stop-gap in the case of absenteeism.

Bonus Rewards on Sliding Scale

The short term policy, which included the rate-revision, also carried with it an additional bonus, per department, for enhanced efficiency. To help the operators over the initial difficulties associated with greater effort for the same money, a sliding scale of bonus rewards was instituted. The target was set for a 5½ day week at the existing bonus rate of working.

If the target was reached before the Saturday, the workers in that particular section were given Saturday morning off with pay. This was important as a psychological urge and as such resulted in the attainment of the new target figures within seven weeks. It needs to be emphasised that the Saturday morning concession was based on the full attainment of the target and not that on the sliding scale. That was the short term scheme.

The long term scheme was based on the fact that at some time in the future it was anticipated that the firm's original scope would be entered into more fully. This took the form of individual designs in furnishings and high quality productions.

This would necessitate the retention of the craftsmen and probably an extension of this type of labour. It was a reasonable assumption that insofar as the planning of the jobs, despite the individual character of the product, it would follow traditional lines with

regard to the preparation of the raw material, i.e., that the timber would still require to be power-sawn, split, dimensioned, thickened, morticed, tenoned and sanded. Therefore the machinists would be included in the planning for future commitments but the batch assembly lines would be discontinued as the new models came forward and instead, linked to the various machining operations would be small groups of joiners who would produce the more individual lines.

The direct incentive would be discontinued in favour of a job rating scheme with a points award resulting in various concessions, plus certain cash adjustments.

Costs per Unit Hour Fell

The policy behind all this was to create happy staff relationships, reduce labour turnover and so establish a bond that would ultimately contribute towards a reduction in unit cost, consequent upon high labour output per man hour. This is in the future.

For the present, interim period, the following figures will demonstrate the falling costs of the unit hour.

A. Before the application of the time study and cost control.

Labour cost at average two shillings per hour, 10,000 hours per week; plus say 100% overheads = £2,000.

But efficiency is only at 55% so unit cost

$\frac{£2,000 \times 100}{55}$ is ————— or £3,636 7s. 2d. by the num-

ber of units produced.

Whereas, as the efficiency rises so the output rises until the breakeven point is reached. Then bonus is paid together with the Saturday concession thus:

$\frac{£2,000 \times 100}{100} + (\text{cost of bonus}) + \text{day morning (at flat)}$

Number of units.
Bonus payable is 35%. Sat. costs 800 at 2s.
 $\frac{£2,000 \times 100}{100} +$

So increased output gives $\frac{2/- \times 35}{135}$

$\frac{2/- \times 35}{100} \times 10,000 + (800 \text{ at } 2/-)$. Taking the

number of units produced as 16,000 in each case (for unit costing) the comparisons are 2.313 £s per unit and 1.013 £s. It will be appreciated that under these calculations an increase in operator output was achieved to the tune of no less than just over 240%.

These improvements are not impossible. Previous examples have shown that extreme cases of inefficiency yield to the extent of 600%. That they are extreme is no cause for complacency on the part of the more efficient set-up for what is considered efficiency is often an ignorance of the true state of affairs. It must be granted that a standard measurement that provides a common denominator gives the answer unequivocally, industry's greatest need is just that.

BUSINESS IN WESTMINSTER. Every day the influence of Whitehall and Westminster on business grows. **BUSINESS** has asked Thomas Creevey to interpret Parliament and the official scene for its readers.



Budget Barometer Set Fair

THOMAS CREEVEY

pen name of an able back-bencher, is an expert on certain phases of business management with experiences of business and politics both in this country and in the United States.

BY coincidence, since the President of the Board of Trade left on the Indian Mission, a more optimistic air has prevailed at Westminster and permeated the country. Least convinced has been the business community itself which remains uncertain as to the Government's intentions. All the same, statistics of production and manpower at work, exports and orders on hand, are most encouraging, and Members of Parliament are less worried by constituents' business troubles.

Exceptionally, hornets nests are stirred up by such outbursts as that of Christopher Shawcross's attack on the motor industry. But the Member for Widnes probably does not like being overshadowed by his Attorney-General brother, and that may well account for his pugnacity.

In spite of the harrassment of many business men, the Government itself is well pleased at the progress made in reconversion from war to peacetime production. It has proceeded far more smoothly and speedily than they at least anticipated. Further, the public acceptance of the continued austerity at home, to enable export trade to be built up has gratified Ministers. For some of this success a highly efficient Public Relations Department deserves credit.

All the same, the Board of Trade is swamped with inquiries and requests for permits for factory building, and export and import licences, and the hundred other things with which the Board is now concerned. Created as a regulatory department it has had to convert itself to a productive ministry, and it goes against the grain of some of its oldest inhabitants. A machine built

up to restrain, takes time to convert into an efficient productive unit.

In some quarters the demise of the Ministry of Production is still mourned. The Board has absorbed many of its functions but has not the machinery or personnel for carrying them out.

In these circumstances, Overseas Secretary H. Marquand, handicapped for a few months by illness, is now doing a Herculean job. All who have contact with him are filled with praise for his sincere desire to understand the exporters' requirements and to give them genuine help. But he is buried beneath a mass of paper against which his life is one continual fight. He is ably served by one of the Parliamentary Private Secretaries to the President, John Edwards, M.P. for Blackburn, and an official of the Post Office Engineering Union.

Both Marquand and Edwards are academic types applying economic theory to practice, and, with state planning the basis of the Board's policy, this works. Marquand was of course Professor of Industrial Relations at Cardiff University and Edwards was previously secretary for Adult Education at Liverpool University. By way of contrast, the Parliamentary Secretary, John Belcher, M.P. for Sowerby, has nothing academic in his make up. A railway clerk at Smithfield before the war, he organised meetings for the Ministry of Information in its later days. He is an out of doors man preferring functions of all sorts to his desk at Millbank, and sometimes to his Parliamentary duties.

Recently he was not on the Front Bench when a question to the Board was reached on the Order Paper. The Lord President,

had not been provided with the answer.

When Cripps returns he may apply a brake to the current optimism. He has stressed all along that today this country is enjoying a sellers' market; that we can export all that can be produced, and therefore however encouraging the figures today they are no guide to tomorrow. Cripps looks to the time when the sellers' becomes a buyers' market; and that underlies his working parties and the policy applied to the granting or withholding of factory building permits.

In his view it is no good expanding industry solely for a temporary market. Industry must make itself efficient enough to hold that market when prices become competitive again. He probably underestimates the intelligence and foresightedness of the business man who looks to the future in precisely the same way. At least he would, if uncertainty as to the government's attitude to private enterprise were removed.

This applies particularly to the iron and steel industry which was the subject of the Minister of Supply's statement the day before Parliament adjourned for the Easter recess. Its vagueness disturbs the Opposition and its incompleteness, Government, back benchers. The Cabinet was disunited over the extent and timing of the statement. One section thought it better to wait until a more complete plan could be put forward. The Opposition showed this would have been better tactics since the attack that followed disclosed how far from defined were the Government's intentions. Steel is to be subject to a measure of public ownership, but the extent of nationalisation and the proposed organisation of the industry remain factors unknown apparently to both Government and Opposition alike.

Tangle of Steel

The Government has no known plans for its administration and operation, but does not appear to realise that its nationalisation entails far greater complexities than does that of the coal mining, transport, gas and electricity industries.

The Government will remain vulnerable to Opposition attack if it rushes ahead with nationalisation of the steel industry without regard to its effect upon production costs and exports. It is no good applying doctrine for doctrine's sake. It must be accompanied with a workable plan which leaves the industry more efficient and better organised than it finds it. The case for steel nationalisation has yet to be proved, the Tories claim.

The Budget did little to remove the uncertainty which confronts businessmen. The Chancellor added his quota to the optimistic mood in a lucid and sparkling performance which the House now expects from him. His account of the country's gratifying resilience surprised and pleased the Government and Opposition benches alike, but the latter were a little more sceptical. After all, with taxation at intolerably high levels budgets can

be balanced, during such times as the present, when the demand for goods is insatiable. The big query is whether production will continue economically and efficiently; that is, whether the necessary reconstruction and development can take place without some relief from taxation and greater encouragement to incentive.

It was interesting to find that criticism on this score came from both sides of the House, the Government back benchers being more concerned with the curb on the workers' incentive to produce, administered by P.A.Y.E., and the Opposition by lack of incentive to producers through taxation of profits and incomes at the higher levels. The salutary effect of the removal of Excess Profits Tax, which costs the Government little with the prospective decline in its effectiveness, is largely offset by the Chancellor's threat to find an alternative tax on company profits.

'Capital Gains' Tax

Dalton favours N.D.C., renamed Profits Tax, but his supporters have numerous alternative suggestions, including one on dividend distributions. There is also talk of a capital gains tax, which if presented to the Chancellor in a practical form would gain favour with this old supporter of a capital levy.

On balance, the Chancellor has succeeded in providing some relief to the workers in industry, which should have a beneficial effect on their output, but he has offered private enterprise little more than the promise of fair treatment if its behaviour meets with his approval. The trouble is he is the judge, and does not take business sufficiently into his confidence.

To sum up the month at Westminster, this much can be said. The Government has expressed itself as well satisfied with the results of its policy to date as reflected in the volume of production, the numbers at work and the recovery of the export trade. It is equally gratified at the financial position as shown by the national revenue and the decline in war expenditure.

Members on both sides of the House are more cautious in their attitudes as they are conscious of difficulties ahead, and of these the chief is that of production. With approximately four-fifths of industry left in the private enterprise sector some assurance of freedom from unreasonable interference is necessary, if development is to proceed. And the co-operation of the workers through their trade unions is equally necessary.

So far this country has been comparatively free from industrial disputes but many M.P.'s are concerned at the absence of any national wages policy which may result in irresponsible demands as regards remuneration and conditions in industry which would be inconsistent with the present policy of holding back inflation and keeping down costs to enable successful competition in world markets. The Government is more conscious of these problems than its attitude indicates; and discussions are proceeding behind the scenes.

Business Calling . . .

Quotes the Policy of Leaders Helping to Shape Peace Plans

Sir RICHARD BURBIDGE, Bt.
Advertising Begins At Home



"GOODS for export are a vital necessity, but I maintain that the needs of the home market must take more than a bad second place," declares Sir Richard Burbidge, Bt., chairman and managing director of Harrods Ltd.

"The time has surely come," he goes on, "when we must be allowed some respite from the austerities of the war years, and

I am sure that some easing off of the supply position and of the rationing and coupon controls would do more than anything else to raise the morale of the people without which the increased production necessary for the export trade will not be obtained.

"Apart from this aspect, as a result of my recent trips to the United States and Canada, I am more than ever convinced that it is on goods of quality and individuality that Great Britain must rely for increased exports and further it must be recognized that the home market provides through the stores and shops an essential trial ground and advertising medium for our manufacturers."

LORD WOOLTON
Small Profits, Quick Returns



"AS a result of labour and petrol shortage we have been rendering very poor service to our customers, who have been compelled to waste much time and patience standing in queues in order to get their supplies," states the Right Hon. Lord Woolton, P.C., C.H., D.L., LL.D., chairman and senior managing director of Lewis's Ltd.

"The delivery of goods," he goes on, "has been largely suspended, and many of those services which it has been both the necessity and the pride of this trade to render to their customers have been entirely absent. Conse-

sequently profits have been on an abnormal scale, but excess profits tax has secured this benefit for the Exchequer and not for the shareholders.

"As we proceed to normal conditions of trading these abnormal profits will fall. It is only on an increase in the supplies of goods, and consequently in turnover, that this company, which has been so largely inconvenienced along with its customers, by the shortage of the necessities of domestic life, can depend for the maintenance of a reasonable rate of profit. This business has never sought to make large profits except on the old adage of 'small profits and quick returns.'"

MAJOR-GENERAL J. S. CRAWFORD
An Appointment



MAJOR-GENERAL J. S. Crawford, C.B., C.B.E., is retiring from the Army and has accepted a seat on the board of Guy Motors Ltd., and will be taking up the position of director resident in London as from June 1st. General Crawford received his engineering training in the heavy engineering industry, and had travelled extensively in Europe

and the Far East before he entered the Army at the age of 26. He is a Member of the Institute of Mechanical Engineers. His Army career has been entirely concerned with the technical side of the service, in armament, tanks and wheeled vehicles.

Sir CHARLES BARTLETT
WAKE-UP Managers!

SPEAKING as a "non-political industrialist interested in the question of industrial efficiency," Sir Charles Bartlett, managing director of Vauxhall Motors Ltd., has given it as his opinion that industry now is in a highly dangerous situation as a result of the negative attitude of management towards the effects of education in the past 20 years.

The advent of a more reasoning work people, he believes, the future products of the Butler Education Act, will bring about a situation highly charged with dynamite. Instead of industry being split into two armed camps, management should take labour into closer partnership.

Do we yet understand, he asks, that the only way to increase our standard of living is by increasing the productivity of our industries? How is this to be done? It is a mistake to think that everyone must work a little harder.

Sir Charles believes we are heading for a time when the reward of capital in industry will be limited to a fair return. He favours, for the workpeople, a minimum wage, plus a wage fluctuating with the success of the business, which would be, in the long run, the success of the country. Industry, he declares, is looking to its management for leadership.

Mr. ALFRED CLARK

A Retirement

MR. ALFRED Clark, well known pioneer of the gramophone industry and one of the founders of the E.M.I. Group, has retired from the chairmanship of the board of Electric and Musical Industries, Ltd. In view of Mr. Clark's wide knowledge of the radio and gramophone industries, extending in the latter case over a period of 56 years, and his continuing keen and active interest in all the company's affairs, he has been asked to continue as a director and also to be president of the company.

The deputy chairman, Sir Alexander Aikman, C.I.E., who has been a member of the board for a number of years and who temporarily filled the position of managing director between the date of the retirement of Sir Robert McLean and the arrival of Sir Ernest Fisk, has been elected chairman.

Sir FREDERICK J. WEST

Developments in Manchester



NEWs of developments in Manchester's port facilities comes from Sir Frederick J. West, K.B.E., chairman of the Manchester Ship Canal Company. "We have already made an effective start in modernising or enlarging certain of the port's services by placing orders for new quay cranes of the most up-to-date type and for tugs of greater power

and higher efficiency than any we have yet had," he says. "We have also made a start on our plans for improving the timber handling facilities at the Manchester Docks. Open berths have been re-surfaced with concrete and asphalt to make them suitable for the operation of mobile cranes and of other forms of mechanical handling with which we are now experimenting."

Attention is also being given to the dredging equipment, development of industrial sites, and the extension of the railways. Sir Frederick is more than justified, therefore, when he concludes: "We are preparing to add our weight to the efforts to win the country back

as quickly as possible to something like its pre-war prosperity. This will make great demands upon all of us. It is not what we can get out of the national purse that is going to benefit us in the long run, but what we can put into the national effort."

Mr. R. P. SLOAN

Points For The Government



FOUR points for the Government to consider in relation to their policy of nationalising the fuel and power industry are made by Mr. R. P. Sloan, O.B.E., chairman of the North-Eastern Electric Supply Company Ltd. Mr. Sloan believes that before coming to a final decision the Government must satisfy themselves that their policy will result in:

(1) A better service being given to users of electricity; (2) As good or better conditions being afforded to employees; (3) The capital employed earning a reasonable return without any subsidy by the State; (4) Continuity of management being assured and the management being centred in the several comprehensive areas, each having sufficient freedom to develop to the best advantage.

"Unless there is good reason to believe these results will be achieved, it would be better for all concerned that some other solution of the problem of co-ordination of the industry should be found," Mr. Sloan concludes.

Sir GEOFFREY ELLIS, Bt.

Manpower and The Army

ONE solution to the problem of meeting the demands of industry and the Services for skilled labour is made by Sir Geoffrey Ellis, Bt., the chairman of the Monotype Corporation Ltd.

"We are in the same difficult position as all other specialist engineering firms working for export," Sir Geoffrey declares. "Many of our older apprentices and young skilled men, reserved during the war, are now under call for the Forces, and this drain, if it continues, will seriously impair our production both for the home and export markets."

"We hope the Government's military advisers will seriously consider a shorter period of initial army training for technicians and young skilled and professional men, followed by several annual training refreshers of not too long a period. Such men learn their army work more quickly than the ordinary army recruits, and the shorter course (without destroying military efficiency) would have the double effect of not too long a period of intermission in the use of their skill and also prove a means whereby we could still preserve a reasonable amount of home and export production."



LOOK-OUT for NEW IDEAS

whilst it is easy to pack for transportation. The novel coils mean that springs can be replaced without skilled assistance and without replacing the whole mattress as usually happens.

● **Eases the Burden.**—Canadian scientists have developed a liquid oxygen apparatus which, thanks to its lightness and the fact that it generates its own oxygen, will permit commercial aircraft to increase their load by as much as 500lb. The apparatus also eliminates the necessity of providing oxygen supplies at air bases.

● **Good Stickers.**—A number of adhesives based on shellac have been produced which possess high bond strength for materials like metals, wood, glass, bakelite and other plastics. The adhesives are made in three forms: (1) cements; (2) adhesive pastes; (3) glues.

● **It's Safer By Air.**—Several new safety devices for flyers have made their appearance. They include airborne radar equipment which gives warning of the presence of other aircraft, dangerous high ground, or dangerous cloud formations; an electronically controlled automatic pilot which makes the landing approach automatic; an orbit meter which assists aircraft in orbiting in bad weather; and a fuel contents gauge which gives a reading accurate to within three per cent., whatever the flying attitude of the aircraft and irrespective of the temperature.

● **Twopence Coloured.**—An American broadcasting system has conducted experiments in colour television which have proved so successful that U.S. radio manufacturing concerns have decided to produce colour television receivers. The additional cost of a colour set, as against black and white, will be about 15 per cent.

● **New Insulator.**—A British firm has developed a method of automatically fabricating a ribbon cable for multiplying terminal banks in telecommunication systems. The ribbon cable itself has insulating strips of plasticised paper.

● **Saves Fuel.**—The difficulty of transmitting heat in furnaces by convection has long been recognised. Engineers will therefore be interested to know that a method of forced circulation has been devised to increase gas velocity and thus to give a better distribution over a large chamber.

● **Some Chicken!**—Shortly to be demonstrated in America is a gigantic machine which "lays" a two-roomed concrete house in the manner of a hen laying an egg. In effect a steel form the size of a house, the machine rolls on 12ft. pneumatic-tyred wheels to the site, and 24 hours later rolls away leaving a house ready for occupation except for window panes, doors, plumbing fixtures and finishing touches.

● **Good Tip.**—The wear-resisting qualities of a pen nib or stylo are increased by tipping them with hard chromium. This has been discovered by an Englishman, who has patented the new method of tipping.

● **Warms You Up.**—It has been found that the time taken to reach a comfortable house temperature by means of the usual gas or electric fire is reduced from 50 to 20 minutes by the use of metallic wallpaper as a reflector on a plain plaster wall. It has also been discovered that the heat of a room can be increased by using a special wall covering of wood or other material which allows the wall to warm up quickly and retain the heat.

● **For the Office.**—The smallest garment tickets, work tickets, or labels can be filled in on an ordinary typewriter if they are in rolls. Stands for holding rolls of gummed labels or tickets for use in conjunction with a typewriter are now being produced by a firm of roll ticket printers.

● **Spots Trouble.**—A British railway is running a special coach which automatically drops whitewash on the track at any point needing attention. Instruments in the coach record irregularities, however slight.

"The Problem — To use the Plenty that Science can make"

Executives' BRAINS TRUST



The Quicksands of Timekeeping

1 A managing director says that he has several times attempted to instal some system of time-recording for the office workers. On each occasion people have fallen in with the scheme, but only for a matter of weeks and gradually the time clocks were ignored. The rot set in at a high level because the firm believed example was better than precept and insisted that from the managing director downwards every employee spending the greater part of his time within the office organisation should clock in and out.

These people were the first to let the new order go by default, rapidly others followed suit and used top defection as a supporting argument. Can the office staff be made to clock in and if so how, without upsetting good relations?

MR. LEVER: I suppose it is difficult to start clocking in when you have not been doing so previously. I think it is rather crazy to expect the managing director to clock in. My experience has been that one should insist on weekly paid employees clocking in, but allow as a privilege to monthly paid employees that they don't clock in.

MR. MARTIN: I disagree with you to the fullest extent. There must be uniformity. The employees' contract of employment should state the times at which he is expected to work, and if he does not work to those hours some disciplinary action should be taken at once, irrespective of whether he is a senior or the merest junior.

MR. FORD: I think you are apt to antagon-

ise some of your senior executives if you expect them to clock in or sign a book. I have seen a very large office in New York where they had a girl sitting at a desk, and as everybody came in she recorded their time of arrival. People's dignity was not offended, nor their feelings hurt by having to put their hands to a clock.

MR. MARTIN: There is no dignity offended. A senior person can sign a book and not be ashamed.

MR. FORD: I was asked to sign a book and I am afraid it aggravated me very much. Suppose you were ten minutes late with no excuse? You don't sign a book when you go out three hours late in the evening.

MR. MARTIN: You should be ashamed to put down that you went out three hours late. This may mean that you are not able to do your work in the proper time.

MR. DAVIS: I have been in organisations where I was required to clock. I suggest it largely depends on the number of staff you have. Where the numbers are reasonable you don't need everyone to clock in. All that need happen is for the commissionaire to record the times of people arriving five minutes after the accepted time.

I am all for having a record of people who are beyond five minutes late. You do want to be told, once a week or once a month, the record of people who have been late, so that you can take disciplinary action.

MR. LEVER: I object to any Gestapo method such as Mr. Ford and Mr. Davis have suggested.

MR. DAVIS: There is no suggestion of Gestapo. Everyone on the staff understands that if you are more than five minutes late you go on the book.

MR. LEVER: I object to the time at which senior employees of a concern come to the office or factory. I consider that the standard should be set from the top. If the managing director wants to see what time the people come in, he should be there himself to see them come in. He'd be setting a very good example!

Clocking in for junior employees, yes—because you are buying hours of employment. But in the case of senior executives you are buying their abilities, and within reason it is immaterial to the company whether you start on a given hour or whether you do not. In many cases they work for lots of hours after the junior employees have left. There is a distinction between hourly people and people who are paid to do a given job.

MR. MARTIN: After all that blarney and the stuff about the Gestapo, let us get back to Christian principles. One of the Commandments, I think, was to the effect "Thou shalt not defraud the labourer of his wages." Put that in reverse, and it applies to your senior executives just as to your juniors.

MR. FORD: I think I would rather have Mr. Lever's suggestion of the monthly staff being left to their own devices and trusted.

MR. MARTIN: You have some concerns which pay all their staff monthly, as we do.

MR. FRY: There is an awful lot of nonsense talked about the necessity and effectiveness of the time clock. For hourly people it is used as a record for computing wages. It is also used for some forms of job costing. We are not called upon to assess its merits in these directions, but as a means of getting people in to time, I maintain that it is over-rated and that is being kind. I should like to suggest to the questioner that he starts thinking along these lines; there is no employee in a concern who is not supervised at some level. It is part of the supervisor's job to see that he gets the hours of work he pays for out of the people he employs. He does not need a time clock to do that; further, it is not time at the bench or desk, but effective effort which counts as far as output is concerned.

I suppose, in the average concern, one hundred per cent. timekeeping would add say 1 per cent. or 2 per cent. to output. Such an increase is well within the potential effort of most workers waiting for managements to bring it out. I suggest these people forget their time-clock, and try normal supervisory disciplinary methods. One of the most effective ways I know of getting people in to time is to send for them at starting times; the implication is obvious.

Wanted — Then Silence

2 This is an unusual type of question for the Brains Trust to tackle. It comes from a top executive, a works manager, just finishing a long term of engagement with one of the wartime Ministries, looking for another post capable of satisfying his zest

and especially those advertised in the daily nationals. Preparing for the day of departure he has been trying to get in touch with prospective employers for the last twelve months, and says that so far he has received acknowledgement of only 1 per cent. of applications he has made. "Has war caused business executives to become less courteous?" he asks. "Why is it that advertisers in the daily papers and certain trade journals do not reply to applications?"

MR. MARTIN: I can speak for myself. We do acknowledge every application and tell people whether or not they have been successful.

MR. FRY: I understand that there are so many replies from advertisements in daily papers that it is almost impossible to reply to them all. I don't think it is a problem of courtesy, but of load and custom.

MR. LEVER: It was not the custom before the war. There is no change. There are many concerns which do acknowledge, but I would not feel hurt in similar circumstances if I did not receive a reply.

MR. FORD: It rather depends on the way he has worded his application. I find that if a man has worded his application in an interesting and sensible manner, you take the trouble to see him even if he does not appear to be quite the man for the job.

MR. LEVER: My experience is that a very big majority of applications are very poorly set out. There is no salesmanship about them!

Introduction by Booklet or . . .

3 A pottery manufacturer writes to ask if the Brains Trust could help them in the production of a booklet for a progressive firm to issue to its new employees. Can the Brains Trust say where any copies of such booklets can be obtained, and what would be the best way to tackle its compilation.

MR. FRY: We have a booklet entitled "Welcome Stranger." The booklet of J. Bibby & Sons is another very fine example. The American Management Association have a number of these employer-employee booklets and I believe they have also issued a paper on their preparation.

MR. FORD: I have seen a booklet prepared for giving to workers who have been away during the war. It is the same type of thing, and only has to be altered slightly for this purpose. It was prepared by George Kent Ltd. of Bedford, manufacturers of meters.

MR. MARTIN: I always wonder whether these books serve their purpose. We have set up for new entrants a training scheme in which they are taken round and shown who is who and what we are doing. They are given a quick tour of the works, a quick tour of the office, told the objectives of the firm, and told the various facilities available to them. By that means you can get them

Who's Who on the Brains Trust



1

E. A. LEVER
The Pressed Steel Co. Ltd.

2

JOHN MARTIN
Secretary, I.C.I. (Paints) Ltd.

3

GUEST MEMBER

4

REGINALD W. FRY
*Methods Executive,
Murphy Radio Ltd.*

5

J. P. FORD
*General Manager,
B.E.S.T. & E. Co. Ltd.*

6

QUESTION MASTER

more interested than they would be if they read, just coming from school, a book on chemistry or paints or accountancy. Thereafter they have a series of lectures, running almost permanently and given by heads of departments, who describe the functions of the departments and how they are co-related. They see the whole set-up. The employee who is interested in making a career with the firm will attend these lectures. The others you will never get.

MR. FRY: We think the booklet is supplementary and is part of a satisfactory induction technique. I think that before they go into a booklet, they should read some back issues of "Personnel," the internal story of the Personnel Division of the A.M.A. They would get a lead into both the philosophy and the technique of induction—what you

are setting out to do, how you are doing it.

MR. FORD: It is an initial approach, though. It makes you think the company is interested in you, and gives you some uplift.

MR. MARTIN: It is analogous to when you join the Gordon Highlanders. Then they give you a little pamphlet about what the Highlanders have done. It conveys nothing whatever to the new recruit. What does he care about Delhi?

QUESTION MASTER: Thomas French & Sons, of Manchester did a very good book. The person who wrote it said, the curious thing was that the new workers skipped the parts that had been thought important and read the rest. They were more interested in the ancient history of the firm—in the way it was founded and built up—than in this or that Welfare facility installed a few months ago.

MR. FORD: But they are still interested to know that they can play games and have other Welfare facilities.

MR. MARTIN: But generally you advertise that sort of thing before recruitment, to entice employees to you. The majority of our intakes are recommendations from our own employees, which is the best form of propaganda.

MR. FORD: But you can't splash that in the local press or in the technical press, because they don't read it.

MR. MARTIN: Even to-day we have to turn down more people than we can take on because they have not the qualifications. We try to set a high standard to begin with, and we feel that we can afford to be choosy even yet.

MR. FRY: I believe that far more effective than the booklet is the instruction of super-



A difference of opinion. Martin good humouredly disagrees with Ford

visors in the technique of introducing employees to their work. It is the workers' first few days or weeks in the factory that really settle his subsequent attitude. Initially and subsequently the person responsible for their attitude towards the organisation is their immediate supervisor.

MR. MARTIN: You cannot generalise. A foreman may be in charge of 500 men, and a charge hand be responsible for only two or three. A supervisor should show them the amenities, fix up the time of their lunch, etc. They should not be left to the foreman.

MR. DAVIS: My view of a booklet of this kind is it cannot go further than relieve the executive of outlining the whole of these points at the time of the interview. If you were strictly fair, you would go through them before you ever took the responsibility of asking someone to take a job. The booklet should therefore, in my opinion, come between that point and the point of taking up duties.

As to the reaction of new employees, that is going to result not only from contact with the immediate executive but from contact with workmates. It is the first week or fortnight that counts. I do not feel that passing them over to a sponsor or third party of any kind is going to get the same response as personal contact.

Fair Post War Car Reliefs

4 "Pre-war our representatives provided their own 10-h.p. motor cars," writes an office equipment manufacturer, "which they used fully for the company's business, provided their own garage, paid all outgoings, and bought new cars as required. The company paid 2½d. per mile to cover all this, and the representatives were satisfied. On occasions machinery up to 4 cwt. was carried. Owing to the mileage of these 1939 cars, now between 50/60,000 miles and the heavy cost of repairs to-day, for some time the company has paid 2½d. per mile, plus all major repair bills. What, in the Brains Trust opinion, would be a fair allowance to-day, per mile, reverting to pre-war conditions, that is limiting the company's liability to a total payment per mile only?"

MR. FRY: The Civil Service have just published a table of the rates per mile which they are prepared to pay. It seems a very fair scale.

The following rules for Civil Servants using motor cars came into operation on the 1st January, 1946:

"Regular users of private motor cars will receive an annual allowance of £36 payable quarterly in advance plus an allowance for approved mileage of 3d. per mile.

"A regular user may be defined as an officer who is authorised to use his private car regularly on official business and whose annual official mileage is expected to reach 2,000 miles. An officer whose annual official mileage is not expected to reach 2,000 miles should not be treated as a regular user without the specific consent of the Treasury.

"Casual users will be paid 6d. a mile for the first 2,880 miles a year and 3d. a mile thereafter. (2,880 miles at 6d. is £72, which is the amount a regular user would receive for the same mileage)."

MR. DAVIS: I went into this for a 10-h.p. car. With the limited mileage for which you can use a car for private purposes to-day I came to the conclusion that 3½d. a mile was a fair figure. I was assuming private mileage of 50 miles per week.

MR. MARTIN: If they are habitually using a private car to carry 4 cwt. they should have a "C" licence, and it should be taxed and used as a goods vehicle. The figure of 2½d. is very low. In our concern the executive does not decide whether he needs a car. It is decided for him, and the car belongs to the firm.

MR. FRY: I disagree with that.

MR. LEVER: I should like to say first of all that my experience has been that it is in every way preferable for a company to own the cars used by its employees. In peace-time, and in the long run, this is by far the most satisfactory arrangement. If, however, the company insist on representatives providing their own cars, I would suggest a payment of 3½d. a mile as Mr. Davis says, or alternatively—and in my opinion preferably—a fixed weekly payment of, say, £2 a week and about 1d. per mile. I have known of concerns which credit a representative's account with a fixed sum each week on which he can draw when he is changing his car.

Ahead With Wages Alive to New Ideas

Reliance Rubber Gets Bigger Output

By BRIAN CUMMINGS

DOWN in Lots Road, Chelsea, there is the factory of the Reliance Rubber Company Ltd., which produces rubber hot water bottles and other surgical and mechanical mouldings. It is an independent and old-established firm, founded in 1880: beside the great power station which is its neighbour it looks almost puny. But it is efficient: its Production Per Manhour is high.

From the first, one idea dominated the managing director's activities. He believed that rubber hot water bottles could be mass produced, that if men could produce them speedily enough they could be paid more than what was regarded at the time as a proper wage.

That he was right is proved by the stability which the business displayed between the wars and during the period of hostilities. Mr. Fordyce Jones is a living example of that modern paradox, the practical man and the idealist. Let us see how he has achieved his success.

The manufacture of rubber goods involves the compounding of drugs, softeners, accelerators and the necessary sulphur, waxes, fillers, etc., with raw rubber, and giving the whole mixture a heat treatment. This last process is known as vulcanisation.

In the very early days of rubber goods manufacture, the periods of vulcanisation lasted 100 minutes or more. Progressive reductions have, however, been made by the introduction of certain chemicals which became known as ultra-accelerators.

In pursuit of P.M.H., the firm introduced and developed ultra-accelerators in this country, making some of them in their own laboratory. They have progressed to such an extent that in the Reliance Works today the vulcanising process takes only five minutes, or less, per article.

That figure of five minutes is no accident. It fits into an overall cycle of 5.75 minutes during which time the worker, who operates four moulds, produces four moulded hot water bottles.

With further accelerated compounding it would be possible to speed the vulcanising process still further. This is not done, however, because the worker would not have time to remove the bottles from all four cores and re-load the moulds.

It is a far cry from the old 100 minute set-up to the cycle just described, which is the nearest thing possible to perpetual motion in such work. Yet in all the adjustments which were made to achieve the revolution, there was no management-labour dislocation. Why?

No Rate Changes Without Discussion

I got the explanation from Mr. S. A. Parr, the general manager of the company. "No alterations in rates or time are ever introduced without prior consultation with, and agreement by the workers," he said. "No speed-up process has been introduced without the workers gaining benefit from the increased production which resulted."

Mr. Parr used to give frequent talks to the workpeople in which he explained the economics of selling hot water bottles. He was able to show the workers that if a man produced 300 bottles a day, they would bring in a fair profit, but if he produced only 200, there would be no profit at all.

That particular piece of economics relates to pre-war years, and the costs and retail prices prevailing at the time, but it is an object lesson to management in the value of putting across P.M.H. to the workers. Hot water bottle output at Reliance has doubled

in the last ten years, though held up by the war for five years.

"If you treat the worker as a human being who is entitled to be told what is really going on in the business, you will always get work out of him," said Mr. Parr. "I have no time for the people who say workers don't want to work. They do want to work—provided they are treated the proper way."

Reliance plans to produce very soon 40,000 bottles per week, in addition to many thousands of smaller articles. This is pretty good for a concern employing only 250 people. The men and women who produced during the war many millions of washers, gaskets, engine seals, tank rollers and engine mountings for the Ministry of Aircraft Production, Ministry of Supply and Admiralty, are turning to the labours of peace with a will.

Incidentally, it is worth noting that the firm worked continuously—day and night—throughout the war. And after October, 1940, they never had one stoppage for air raid alerts or for any other reason. At their own request, the men came up from the shelters and worked.

The firm also has an informal works council. Characteristically, Mr. Parr said it was "nothing high falutin—really only a friendly discussion between management and the workers."

The council is composed of representatives from each shift in the press and mill room, two representatives from the finishing shop

(staffed entirely by women), the works manager, and Mr. Parr himself.

The value of this body is proved by the fact that the firm has never experienced restrictive practices on the part of labour, while all but one of the employees who left for the Services during the war want to come back. And despite the shortage of labour, "outsiders" call daily at the office for work.

So much for works relations. Now for incentives. It has already been stated that Mr. Fordyce Jones believes in paying good wages. He believed it in 1931, when he paid press operators £5 a week as compared with the current average of 50/-. He still believes in it. The 1/- an hour man is expensive; the 2/6 to 4/- an hour man is cheap.

Payment today is based on piece work, and the rates are higher than those prescribed by the Joint Industrial Council for rubber, and the trade board. There is a guaranteed time rate for everyone, below which their earnings cannot fall.

It amounts in the case of a press man to 2/6 per hour, and in the case of a girl from the finishing shop to 1/8 an hour. But a first class press man earns an average of 4/- an hour, and makes 31/- to 32/- a shift.

There are three shifts, designed to cover the whole 24 hours—7 a.m. to 3 p.m., 3 p.m. to 11 p.m., and 11 p.m. to 7 a.m. These are worked for five days a week, which means a 40-hour week for everyone.

Valuable Incentives

Said Mr. Parr: "We are firmly convinced that a 40-hour week is the ideal, and that if the workers can be induced to work really hard during the eight hours they are on the premises, output will usually be higher than what is normally expected from a 48-hour week."

Of course there are snags. P.A.Y.E. is one. Both Mr. Fordyce Jones and Mr. Parr are agreed on the need for cash incentives. But, they point out, under the P.A.Y.E. system such incentives simply do not work beyond a certain point.

"If we raised the rate of our men from the £7 10s. which they can earn on a 40-hour week, to £10 a week, they would not make any more effort because they would hardly see any of the extra money," said Mr. Jones.

Mr. Parr made a point for the man at the other end of the income scale. "Is it not fantastic," he said, "that even with the new concessions, a single man earning £3 a week (and we all know what that is worth

This way hot water bottles come from the moulds one at a time. Actual process time remains constant but . . .



these days) still comes within the income tax range."

Despite such difficulties, however, Reliance output is high. Indeed its chairman claims that for its capital, the firm's P.M.H. is higher than that of any other comparable industry in the country.

We have seen that Reliance have achieved this by keeping super-sensitive to new discoveries affecting rubber; by paying generous wages; by making an exact study of their actual production cycle; and by taking the workers into their confidence. What factors remain?

There is plant, of course, and plant layout. In the matter of plant, here is a model to all British industrialists. There isn't a machine in the place more than 15 years old. And new machinery is always being installed. Four new presses are being put in at this moment.

Yesterday's Plant Won't Do

Again there are the usual difficulties. Most of the new rubber processing machinery appears to be going for export. No machine is available at home less than a year from the date of ordering, and most of them are taking 18 months for delivery. Even so, Mr. Jones reckons that in plant, the British rubber sundry industry is leading the world, and has nothing to fear from anybody.

Reliance are constantly designing new moulds. Before the war never a year went by without the introduction of at least four new hot water bottle designs. Such a policy is impossible now because of the difficulty of getting new moulds and the time taken to recondition old ones. It is also unnecessary while the shortage of bottles lasts.

But the new moulds will be made, and new processes tried out. The firm has done a great deal of research lately into the idea of curing by radiant heating. The firm that introduced ultra-accelerators and seamless mouldings refuses to rest on its laurels.

The Lots Road premises could hardly be described as a model of stream-lined lay-out. Mr. Fordyce Jones is tackling this problem also, for he believes that where production is based on a unit price (as is the case at Reliance) it is possible to reduce costs 5 per cent., 10 per cent., or even more, by means of efficient, modern lay-out.

In the new works which Mr. Jones is planning, the need for stream-lined layout will be kept well to the fore, the tradition of up-to-date plant will be maintained, and the

with twice as much in the press, production is speeded up. Same time in press, same labour, but double output

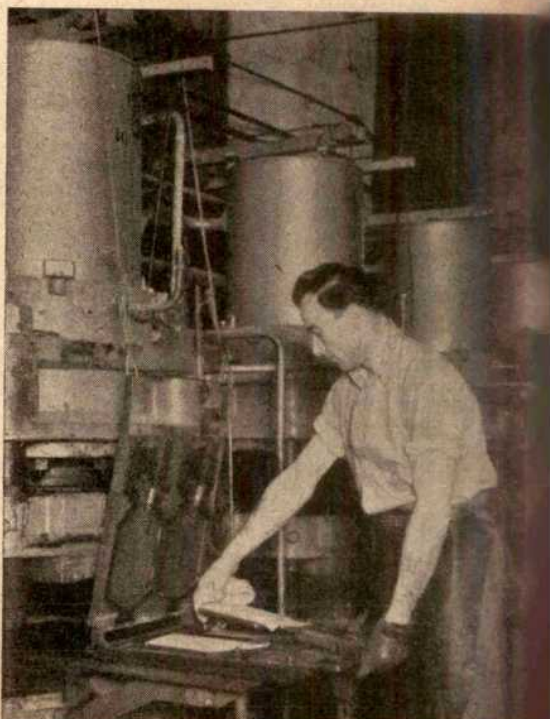
welfare of the workers in such things as light and ventilation will be given proper consideration.

For, when all is said and done, every industrial undertaking depends for its success on the workers. That this is recognised by the management here has already been shown. It is even demonstrated in the size of the concern itself. The company began as a small family business, and the management is content that it should remain within the 250 to 500 employee class.

"In my opinion," said Mr. Parr, "the ideal size for an organisation is, from the P.M.H. point of view, 300 to 500. Once you get beyond 500 you lose that personal touch which means so much. On the other hand, you need as many as 500 if you are to run a proper training scheme—another important consideration in discussing P.M.H."

His last word was addressed to management personally. "We at Reliance," he said, "have always made a point of keeping up-to-date in our plant and processing. But remember that you cannot introduce any kind of new process or machinery without the co-operation of the human beings who are your workers."

"I think that with an acceptable and good leader you can get anything that is reasonably possible from the workpeople. But they have got to know that he would not ask for anything impossible, and that he would at all times see to it that they got fair play."



Give the Labour Office Full Facts

1 2 3 4 5 6 7 8 9 10 11 12 U												FEMALE SEX OCCUPATIONAL CODE 1 2 3 4 5 6 7 8 9 10 11 12
TH FR SAT												
DEPARTMENT NUMBER												
PLAT	W ALLIN		F D M		BONUS		BESPOON LLE					
1917	1673		170									
Birthdate	Stratting Date		Class		Widely Tax Allow							
211004	5 040823		136		3 6 3							
Rate		612 176 1		Net Tax Mo								
CLASS MO		RANK		TAX CASH		WM		VI				
30123		OTHER A N		12 10								
DEPT/SECTION		54		TAX CASH		16		M				
ADDRESS 99 ONE MILE HILL BRISTOLE												
MOB PL		WM	U	W	W	WIDELY TAX ALLOW						
30		12	10	5	414	815		3		6 3		
CR 4 7559 PAY. MOD. 475000 507500 L C MOD 3 6 GOOD MO 4 1961												
AUTHORISATION TO ADDRESSOGRAPH - STARTER												
BASIC RATE												
SHILLINGS		PENCE										
1 2 3 4 5 6 7 8 9 10 11		2 1 10 11										

it the following documents are printed:—

1. Proof on the back of the Starting Slip.
2. On a Personal Envelope: 3. A Labour Statistics card (fig. 2). 4. The first "tuition" job card. 5. The "starter" History and Record Slip, and, in addition, the Pay-card for the

week and the Pay Envelope for the week. These documents are returned by the Addressing Section to the Wages Department.

When the new employee presents himself for work, he hands in his Insurance cards and Income Tax (P.45) and is "clocked on" on a tuition job card.

He is then given an identity pass and a form of Welfare notes and the Rules of the Company. Next he is conducted to the Departmental Timekeeper and, in the meantime, the Pay and Job cards have been sent to the Departmental Timekeeper via tube conveyor for filling in.

The receipt of the documents notifies the Departmental Timekeeper that the worker is on the way and when he arrives there he is taken to the Departmental Supervisor where he is issued with a job and is then "clocked off" the tuition job card.

All alterations regarding the promotion and the workman's increase in his pay, transfer from one department to another and alteration to deductions must be embossed on the addressing plate.

An advice of authority for alterations is made out for each of these alterations and the altered plate is printed on a slip post history record slip (fig. 3).

When the workman's employment is terminated, the Departmental Manager makes out a Termination of Employment card and a Termination Slip Post is printed, the addressing plate being withdrawn.

It will thus be seen that the under-noted Labour Record cards have been produced as a by-product from the information that is necessary for the production of time-keeping

records and payroll records. These records are divided into two classes:—

1. Unit Cards from which mass information can be extracted. Authorisation for starter. Labour Statistic Card. Authorisation for alteration. Termination of employment.

2. A personal record of each man in an individual envelope. Personal envelope. Application form. Past History slip post card showing: (a) New Start, (b) Periodic Report, (c) Alteration, (d) Promotion.

Fig. 3.—The build up of the slip post Record Slip ensures accurate summary of each employees history

RECORD CARD LABOUR STATISTICS	
THE BRISTOL AEROPLANE CO. LTD. FILTON HOUSE, BRISTOL.	
BOOT MANUFACTURE	1 PRINTING
BUILDING	2 SCHOOL (PUPIL)
CLERICAL	3 SHOPKEEPING
CLOTHING	4 TAILORING
COAL	5 TEACHING
ELECTRICAL	6 TEXTILES
ENGINEERING	7 TOBACCO MANUF.
FOOD MANUFACTURE	8 TRANSPORT
FURNISHING	9 WOODWORK
MOTOR TRADE	10 MISCELLANEOUS
	20

Fig. 2.—Labour Statistics Card after stencilling. From Starter Card and Stencil Dept. the Labour Record takes shape. Provision for alterations is made on reverse side of card

CLOCK NO. 30123 OTHER A.N. 547 NAME HOLD HERE	NO. NO. 140028		SHIP SEQUENCE OR BATCH 4		QUANTITY REQ. 10 OFF 5 SETS		DATE 12/3/46		DRAWING NO. 483364-10		
	TOYER GROUP NO. 483364-A/1		PART DESCRIPTION ANGLE COMPLETES 25 SETS				UNIT LETTERS 2		PRIORITY 4		
	OP. NO. 1L		OPERATION DESCRIPTION SEE ROUTE CARD.		NO. OF DEPT. 1 SS		M/C NO. B		TIME ALLOWED 20 EACH		
	MAN'S RATE		HOURS		REACTS		PAY FOR		PREV. TIME W/E		
	TIMEKEEPER		BONUS CALC.		NO. OF REPS OR JOBS		WAGES		BONUS		
								TOTAL		TIME SAVED	
										DUPLICATED	

Fig. 4.—The pre-printed Job Card is pre-punched by Production Control. Via Timekeeper it goes to Calculating Dept., extended and returned to Timekeeper

Authorisation for Starter Card is punched with department and clock number, occupational code and rate; from these a weekly and monthly analysis is made of all new employees, then this card is filed in clock number order.

Labour Statistic Card is punched for department number, clock number, male, female, youth or part time, the rate, previous occupation, starting date, birthday date and the present occupation, and the proof of any alterations is printed on the back as they occur.

From this card statistical information under any of the above classes can be obtained speedily at any time. These cards are filed in departmental and clock order.

Authorisation for Alteration Card. As previously indicated, the card is used for every kind of alteration to the Pay Roll except a "new start" or a "Left."

Alterations of deductions obviously do not affect labour statistics but other alterations such as rate increases, changes of occupation and inter-departmental transfers do; therefore, in these cases the relative information is punched out on the card, *e.g.*, the old department and the new department number in the case of an inter-departmental transfer; "Non-productive work" and "Productive work" in the case of a transfer from a non-productive to a productive occupation—and so on.

From these cards (which are specifically filed under the clock numbers of the employees concerned) a monthly report is compiled showing, for example, the number and value of the wage increases; the number of changes of occupation and the grades of labour affected; variations in departmental manning, etc.

Termination of Employment Card. This is punched for departmental number, clock number, the occupational code and the reason for termination.

From it a weekly and monthly analysis is speedily compiled, divided into any of the above classifications, the most important one being the analysis of the reason why the employment has been terminated.

Thereafter all documents relating to these

former employees are extracted and filed separately to give particulars of all workers who have left the employment of the Company.

It will thus be seen that these cards can serve three purposes:—1. To give any desired statistical information of the current labour strength of the Company and engagements and discharges. 2. To give a complete analysis of the variations that occur each week in the way of engagements, discharges, increases, etc. 3. To compile automatically a personal record of each employee.

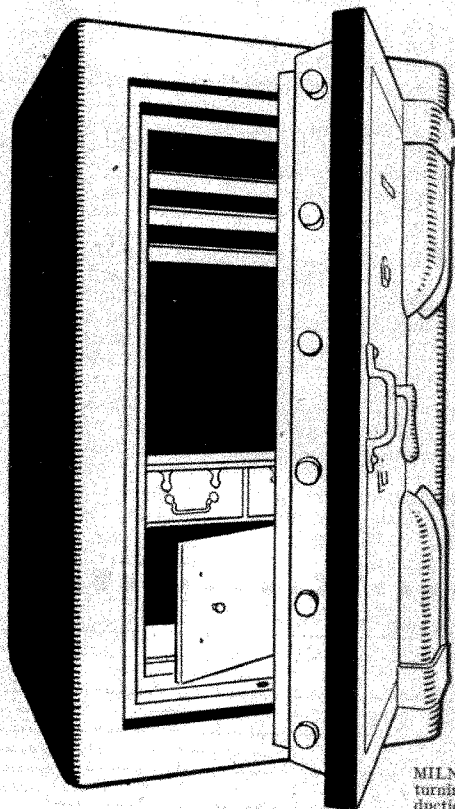
The provision by the addressing section of the slip post history record cards recording first the engagement and then any alteration of wages, occupation and department, supplies the need of the Labour Manager for a complete history of each employee. These cards, when hung up on a backing sheet, form a visible historical record of all changes, while in order to make the record complete from a personal angle, the labour manager himself records particulars of any interviews, etc., on a slip post card prepared for that purpose. These are then hung up on the employee's record in chronological order. This history is placed inside a personal envelope for each employee, where his original written application for employment is also filed.

Absentee Records

Each Pay Card shows any hours lost each week by each employee; this Pay Card is (in the normal course of wages procedure) hung up in a visible pack for each employee and therefore the hours lost by each employee can be seen at a glance over the last six months.

Thus an inspection of these cards will give all the necessary records for the control of absenteeism. Again, as these slip post pay cards, filed in visible packs, serve the advantages claimed for expensive visible equipment, in this case full use is made of the provision of celluloid signals, the key being as follows:—Black, frequently absent; Red, case under review; Black and white, first warning to the employee; White, final warning; Green, the employee brought before the Works Committee.

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Timekeeping and Preparation of the Pay Roll For 12,000 Men.

In the Aircraft Industry, as in many others, the production workmen are paid an hourly basic rate plus time allowed for each job. The actual time taken for the job is recorded and the difference between the time taken and the time allowed is extended at the workman's basic rate and thus forms a bonus.

Each workman is employed on an average of six to seven different jobs per week, and as each job card has got to be extended for basic wages and bonus wages, it will be seen that the ascertainment of the wages involves more calculating and more timekeeping than is the case in an industry such as the Steel trade.

An interesting summary of the staff hours employed per employee paid is as follows:

	seconds per employee
Addressing Machine. Preparing Pay	
Cards and Pay Roll	60
Calculating Pay Cards	72
Listing and Summarising Pay Roll	20
Stamps	10
Making up cash for Pay Envelopes	20
Rates Control (Starting and leaving, etc.)	65
	247

4 minutes, 7 seconds.

These figures are based on the following times :—

The Pay Roll is calculated in eight hours and handed over to the Cash Department, and the Cash Department, consisting of six

people, have the making up of the cash completed in twelve hours.

Principles used are namely the use of an addressing machine for addressing clock cards, pay roll and wages envelopes. Here, however, the average workman is engaged on seven to eight jobs per week.

There is no necessity for an attendance card because the workman clocks on job cards when entering or leaving the factory and the total time for the day, as recorded on the job cards, is posted by the Departmental Timekeeper to the Pay Card, as per example: It will be seen that the pay card is addressographed with: The workman's hourly rate, weekly rate, name, department number, clock number, weekly holiday allowance, National Health, Unemployment, National Savings, Welfare Contributions, Income tax code, Income tax standard allowance.

The job cards are pre-printed and pre-punched with full particulars of the job by the Production Control Department (fig. 4).

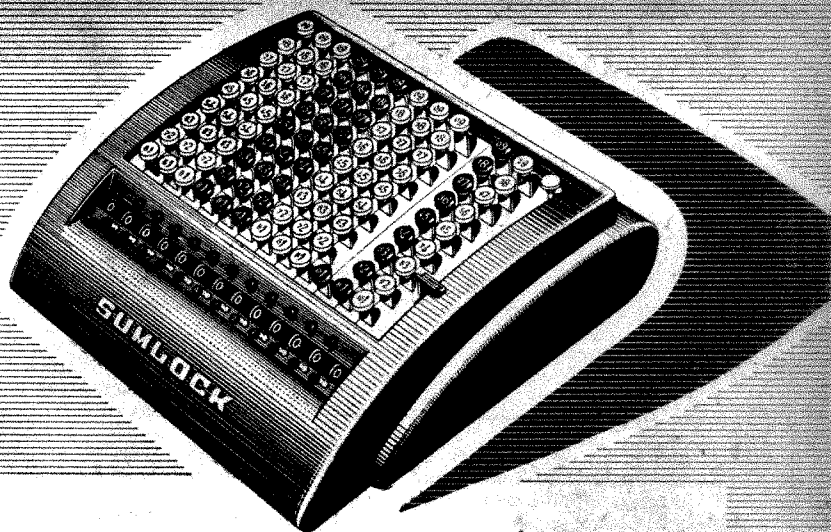
During the week, as each job is finished, the job card is sent via the Timekeepers to the Calculating Department to calculate the bonus, and the job card is then returned to the timekeeper, who enters the bonus on the pay card (fig. 5).

At the end of the week the timekeeper, having checked the hours and bonus on the job cards with those on the pay cards, thus ensuring that he has all the relative job cards, sends the pay cards along with the relative job cards to the Calculating Department who calculate the time wages and add in the

Please turn to page 90

THE BRISTOL AEROPLANE CO. LTD. FILTON HOUSE BRISTOL															PAY & ATTENDANCE CARD.									
DATE		FARE	RICK	LEAVE	ABSENT	EXC.	SHIFT	PAGE	FLAT OUTWORK	BONUS MAX SIRC. RATE	INCL. S.P. ARR.	E	S	O	OP	SERIAL/NO. ORG.								
							S A R	4.5				1.5				1 2004/186743								
							S U B																	
							S M T	8.5																
						10	T U R	4.5	0.3															
02							W E N	8.3																
							T H U	8.5																
							F R I	8.5																
02						10	T O T A L	47.8	0.3															
								1.670	1.587	170														
REPORT ANY QUERY ON RECORD OR WAGE TO YOUR TIMEKEEPER IMMEDIATELY.									PLANNED HOURS D N		61/10 17/16 1		WEEK ENDING DATE & NO.		42/120									
LOST TIME RECORD AGREED AND NET WAGE RECEIVED									47.		30123 OTHER A.		TOTAL BONUS TIME EARNINGS PPE OR S/P		43/180									
									541		CODE 26		WEEKS TABLE 5:8:10		SUMMER WAGE 5:1:6									
									TIME LOST		HOL N H U I WS GO		GROSS WAGE		TAX TO PAY									
									0.2		20 12 10 5 H1R		8/4		52:10:1									
													5:8:10		140									
															4:6.6									

Fig. 5.—As all operators clock on job cards on and off every job, usual attendance card is abolished. Timekeeper receiving extended Job Card (Fig. 4) enters bonus on pay Card and checks all details with weeks job cards



Streamlined **EFFICIENCY**

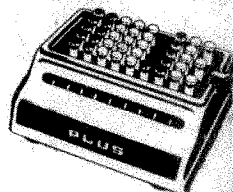
THE SUMLOCK—the only all-British key-driven full-keyboard adding-calculating machine. Essentially a 'business efficiency' machine, it is compact, portable, and ideally responsive to speediest keyboard operation—it is in fact characterised by 'streamlined efficiency'. This unique machine is available NOW on either purchase or rental terms.

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- ★ Its threefold warning of misoperation obviates errors.
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THE PLUS RAPID ADDER

This is the 'junior brother' of the Sumlock. It adds only, but with utmost speed and accuracy. An invaluable time-saver to every Shopkeeper, Accountant, Cashier, etc., etc.

This System Handled Increased Turnover and Solved Staff Problem

By G. L. WIDDOWSON

THE main part of the general system (which we conclude this month) has now been in use for eight years and the repair section for two years. It may be useful to give a summary of the benefits obtained:

- (1) A close check on all stock on the premises or with vanman, and the ability to ascertain instantly the exact position of any item.
- (2) Control of repairs, showing position of a job at any stage, and ensuring prompt costing and invoicing.
- (3) Invoices always ready for immediate despatch to customers.
- (4) Sales and Purchase Ledgers always posted up-to-date, with statements ready for despatch.
- (5) Check on cash, both for wholesale and retail sales.
- (6) The following operations entirely eliminated: making out statements as separate operation, writing up Sales Day Book, writing up Cash Inwards Book.

Sales Ledgers. When the original Invoice has been detached at the perforation and sent off to customer, the carbon copy remains in the binder. The total of the invoice is posted from this copy direct to the debit of the customer's account on the Sales Ledger Card, using for "folio" reference the number of the Invoice.

The total amount of sales to credit to the Sales Account is obtained by totalling all the Invoice amounts on an adding machine. This method of handling the credit postings dispenses with a separate Day Book—the Invoice copies themselves constitute the Day Book. When postings are complete, the Invoice Copies are filed in numerical sequence in a binder.

The Sales Ledger Cards are designed for use with Statements on the same principle as mechanical posting, but an ordinary typewriter is employed.

The Statements are printed with the same account headings as the ledger cards and made to register with them, but the state-

ments have at top right-hand corner a special box section which draws attention to overdue accounts.

The statements also have a perforated flap at left which folds round the left-hand edge of the card and serves as a guide for setting the statement in correct position for the next entry.

Typewritten entries are made simultaneously on the Statement and Ledger Card, the ledger being a carbon copy of the statement, and the balance is thrown out on the extreme right.

The only difference from mechanical posting is that the calculations of the balance are made mentally instead of automatically by machine.

The Ledger Cards (with statements ready attached) are housed in a visible pack, which is designed to give the advantage of "visibility," explained when dealing with a specially designed binder. A "pack" consists of a series of pockets, graduated so that a portion of the top of each pocket is visible. In this visible portion the name and number of the account is shown—Dean & Noble, Ltd. have 20 accounts to view in each pack. The packs are kept in specially constructed trays, mounted on trolleys which render easy the transport of the equipment.

Cross Reference—Double Check

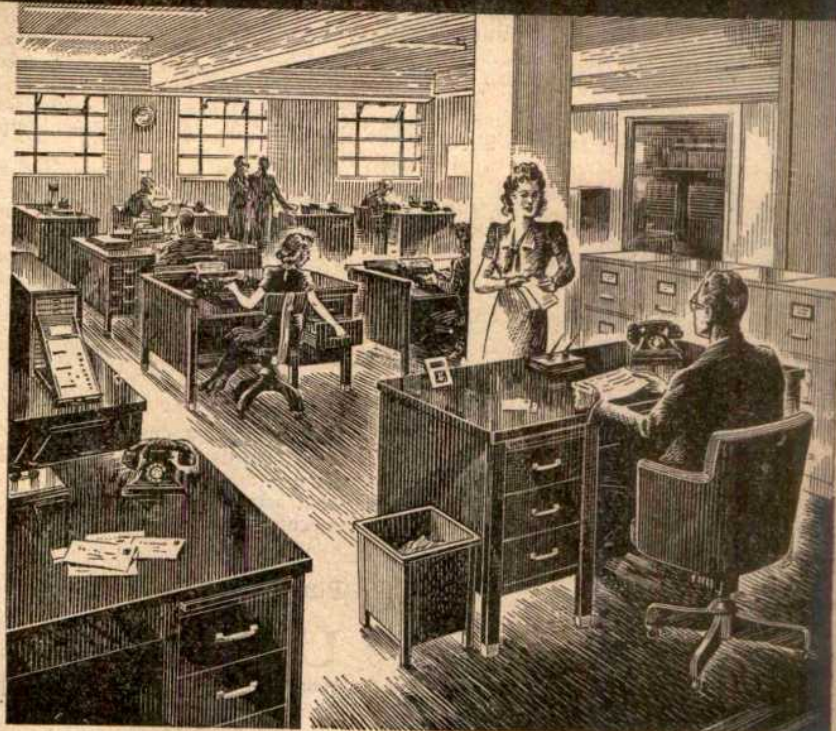
It has been found most convenient to keep the accounts in numerical order in the packs so that the accounts of new customers can be added without disturbing the existing ones.

A small visible card index, mounted on a wall panel, serves as an alphabetical cross-reference to the account numbers.

Purchase Ledger. Cards are used also for the Purchase Ledger, but for distinction, Sales are on Buff cards, while Purchases are on Pink cards.

Cash. When money is received, the usual two operations of issuing a receipt and making a cash book entry are reduced to one. This economy of time is effected by using a duplicate set of forms; the top copy is, to begin with, a single sheet, but is printed with 14 receipts to view consecutively numbered, each one ready perforated to tear off, and gummed on the back for affixing to the statement.

STEEL office furniture



The General Office

Here is a typical "General Office" furnished entirely in ART METAL Steel Office Furniture.

The layout has been planned by our experts to ensure easy flow of work from desk to desk. Each piece of equipment, although a "stock" design, has been made to suit the user's own particular needs.

The complete pre-war range of models is not yet available, but we are always pleased to advise on furnishing problems.

May we post you our brochure no. 60 showing typical models?



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On the left there is space for the date, customer's name, and signature, and on the right there are three cash columns headed "Discount," "Cash," "Cheque." The second copy in the duplicate set of forms serves as the sheet for the "Cash Book Inwards"; this is the same length as, and registers with, the full sheet of receipts, and has also the three headed cash columns.

When a receipt is written, a carbon copy is taken on to the Cash Inwards Sheet. The cash entry is made under the appropriate heading of "Cash" or "Cheque." This arrangement is helpful in checking the totals of cheques and cash, and also when making out the bank paying-in-slip, on which the amounts for cheques and for cash have to be shown separately.

For Cash Outwards there is a similar sheet

of the same size and design, with columns for "Discount," "Cash" and "Cheque." Both sheets are ready punched and are filed in a loose-leaf binder. In fact, Dean & Noble, Ltd. use a specially constructed binder, with two independent mechanisms; on one they file the "Cash Inwards" sheets and on the other the "Cash Outwards" sheets. Thus while each set of sheets is kept separately, the two sets are housed in the same binder, side by side, making one complete Cash Book.

Retail Cash sales are recorded as follows: actual cash is checked with the Cash Till Notes, and then the total amount is posted to the Cash Inwards Sheet as one item called "Cash Till Account." This procedure ensures that all cash received, in whatever form, is shown in the Cash Book.

TWO SHORT CUTS Office Efficiency

Running Low—New Tell-Tale

WE have just learned of an added refinement rendering the $\frac{1}{2}$ inch visible index more fool-proof in those cases where such records are used to give a picture of stock records or salesmen's activities.

In the usual 5 x 8 inch pocket carrying the customary information, a new small card $2\frac{1}{2}$ x 3 inches, is held by a celluloid visible margin.

Where stocks run low or in the case of the sales office, where a salesman makes an urgent promise, by moving the card to the left, a full $\frac{1}{2}$ inch by $\frac{1}{2}$ inch danger signal is exposed.

Here is where the additional refinement comes in. Even experienced operators in haste, might easily lose this record, in which event, in the normal system, there would be no signal visible. Alternatively, if under the small card, the same signal were held on the visible runner, it would not be possible to detect the absence of the "Urgent" ticket without opening or raising the envelope.

The new device, when the urgency ticket is out of place, exposes a half of a danger signal of the same colour as that on the card. This is accomplished by having the $\frac{1}{2}$ inch signal printed on the visible margin beneath the card space and aligning to occupy half of the danger cut-out space.

This way, at a glance, you know whether

stock is low, a customer is desperate. If your records have been disturbed and part of the information is missing, you know what action can be taken and the responsible executive can be contacted again for further information.

Punch Card Filing

USERS of punched cards will have noticed that while the machines have developed steadily over a period of years, very little attention seems to have been given to the various methods of storing the punched cards.

In general, the devices adopted by users are make-shift and rudimentary in the extreme, so that some of the efficiency of the equipment is dissipated by laborious manual work which only too often places undue reliance on the human element.

Recently, a simple, non-mechanical card filing device has been designed which reduces the pulling time by at least one half. Fundamentally, the device consists of some hundreds of compartments built on the egg box principle. Each compartment is capable of containing a group of approximately forty cards and the bottom is so arranged that the top and each succeeding card in every group project beyond the one immediately below; a single card can thus be extracted from any group very easily with one hand. Errors in pulling are reduced to a minimum by a clear index system adjacent to each row of cards.

This provides card identification by means of coding, visible on the leading edge of the card and coloured flashes printed on the index and the right hand side of each card.

In order to splay the groups of cards adequately the compartments are mounted at an acute angle to the vertical, and to make each row readily accessible, the whole of the face of the unit is tilted at 45 degrees. This positioning also possesses many advantages with regard to illumination.

POWERS:

Opening Stock and Receipts - Closing Stock = Consumption
Wages + Overtime + Bonus - Deductions = Net Wages
Cumulative Tax to date - Cumulative Tax last Week = Tax this Week
Present Meter Reading - Previous Reading = Units Consumed
Arrears B/F + Current Instalment - Cash Paid = Arrears C/F

■ PUNCHED CARD ■
■ ACCOUNTING ■
■ TERMS EXPLAINED ■

CROSS-ADDITION

The Powers Cross-Adding Punch has been designed for the special purpose of rapidly handling cross-addition and subtraction calculations. It accumulates several amounts punched in different fields of a card and automatically punches the resultant total into another field of the same card. Simultaneously with these operations it also produces a detailed tabulated record of the transactions. By this unique combination of functions the Powers Cross-Adding Punch enables valuable economies to be made in punching and tabulating time.

The Powers Cross-Adding Punch is one of the many "Powers" developments which enable punched card accounting to provide accurate and up-to-date figures with the minimum of staff in such applications as: MATERIALS AND PRODUCTION CONTROL; STORES ACCOUNTING AND STOCK CONTROL RECORDS; PAYROLL AND P.A.Y.E.; COSTING OF MATERIALS, LABOUR AND OVERHEADS; INVOICING; GAS AND ELECTRICITY BILLING; LEDGER ACCOUNTS; SALES AND MARKET RESEARCH STATISTICS, Etc.

"Powers," the only completely all-British range of punched card accounting machines, may be rented, hire-purchased or purchased outright. Powers Technical Advisers and Accountants will be pleased to assist without obligation in the study of the application of Powers methods to all accounting and costing work.

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Salesmanship

Begins in Each Department

By Making the Man at the Machine Sales Conscious

By V. HAWKE

AN account of salesmanship that deals with almost every department except the sales department may seem at first sight rather like Hamlet without the Prince of Denmark. Yet it has been the experience of the most outstandingly successful British firms that selling is not something that begins when a product comes off the end of the conveyor belt or the assembly line. It begins in the laboratory and on the drawing board. Like good design, good salesmanship is something that belongs to a product all the way along the line. It is not something just slapped on when the job is finished.

The tale is told of Royce of Rolls-Royce, that genius of engineering who was never satisfied with his own work or with anybody else's, that a dear old lady once asked him what would happen if the firm made a bad car. "The man on the gate wouldn't let it through," was the answer. It would have been bad salesmanship to do so, and the man on the gate was as much a Rolls-Royce salesman as the agent in Calcutta or New York. And the present works manager, now on an aero-engine sales trip to Australia, has remarked that the main idea is to turn out engines that the sales department cannot help selling.

Maintain That Good Name

"Goods the sales department cannot help selling." It might be an idea for every managing director in Britain to adopt that slogan and poster it in every department. For the basis of Britain's position as an exporting country has long been her reputation for making goods rather better than any foreign competitor, and in the present export drive no manufacturing firm can hope to maintain its sales after the immediate period of shortage unless it gives quality and never rests content with it. Quality is the best salesman in the long run, and quality is the concern of every department. Sales consciousness, like cost consciousness, has become somewhat dim during the war years. The next meeting of top executives might well ask itself the question, "Is every department helping us to put our goods across?"

Take, for example (the list is far from exhaustive), the following departments of managerial responsibility, and ask what each is doing for the sales policy:—

1. Research
2. Purchasing
3. Works
4. Personnel
5. Testing

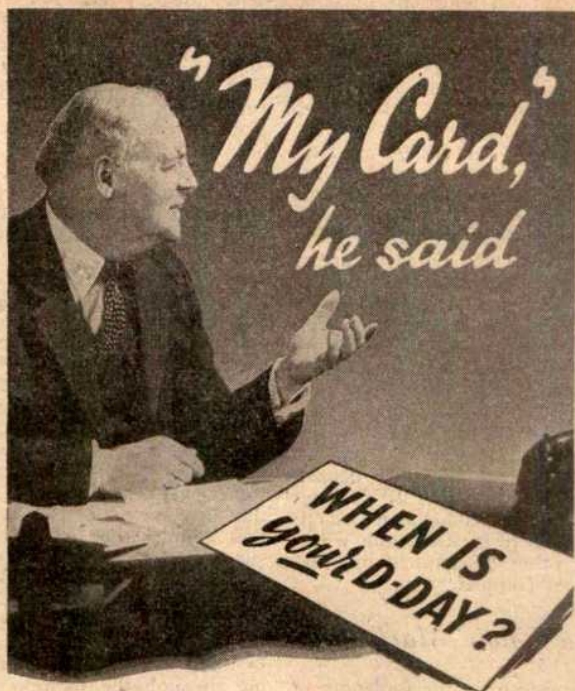
Research. The famous cotton firm of Tootal Broadhurst Lee is prosperous today and has been for thirty years and more. Since 1925, when the sales of the industry as a whole started on a decline of which the end has not yet been sighted, the sales graph of this firm has been going steadily upwards. At least part of the explanation is that in 1926 they reaped the harvest of seven years' research into crease resistance. It was a long-term policy, but it won through. The research department knew that fabrics that would not crease "could not help selling" and for seven years they worked at their test tubes to put this powerful weapon in the hands of the sales department.

Research undertaken today—in textiles, foodstuffs, engineering, transport, plastics, or what you will—may pay substantial dividends when the sales campaigns of seven years hence need new sources of energy and inspiration. We live in a world of sensational new applications of the scientific method—who, after the atom bomb, can question the fact?—and any firm that is short-sighted or purse-tight in undertaking research is laying up troubles for the future.

It is not merely that without research into materials, processes, treatments, no substantial advance can be made. For a firm in a conservative industry with steady balance-sheets for half-a-century past that might appear a tolerable position. Today even the most conservative of industries are being revolutionised by research, and the firm that cannot look more than twelve months ahead may find very soon that it has no future to look to at all.

Purchasing. In the last resort all firms are glorified sausage machines. What they buy goes in one end and what they have to sell comes out at the other. As in the case of wartime sausages, some strange things may happen in between, but in the end it is the raw material that decides the quality of the sausage. The purchasing department should therefore ask itself the following questions:—

- (a) Are there new sources of raw materials better than the old?
- (b) Are there synthetics or alternative



"D-Day," said I. "That's a military term — what's it got to do with business?"

"D-Day, sir, is more than a term," he said. "It is going into the language for evermore as a symbol — a symbol of complete preparedness, of ultimate precision down to every last detail, before the word 'Go' is given and the real job started. "Your D-Day, sir, is not on the Normandy beaches; it's right here in this office. And are you prepared?" he demanded, almost truculently.

That fellow startled me, I'll tell you. When he first got busy on 'frustrated sales energy, dissipated sales energy, sale trends, population incomes and levels, population shifts, climatic requirements, and the like'

—well, I thought it was all high-sounding stuff and a lot of 'hoovey.'

That fellow knew his job all right. He touched me on the raw, but he got me in the end because I knew quite well that he was right.

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cheaper or better than those we have always used, and to which the attention of the management should therefore be drawn?

(c) Are there certain materials or components which in the past we have always bought from outside that might be more profitably made by ourselves in view of technical developments; and should a memorandum therefore be sent to the research chief or the works manager?

(d) Could some of the waste products from our own factories be turned to use as an alternative to the purchase of certain ingredients from outside?

(e) Have we established contact with all our pre-war suppliers and made a careful comparison of the quality and costs of their products?

Some of these, it may be argued by victims of excessive departmentalism, are questions that are not properly the concern of the purchasing department. The answer is of course that this department is responsible for seeing that the works have the best materials at the lowest cost so that the final product and its cost are such that the sales department "cannot help selling it." It is their function to advise the management on its purchasing policy and to seek the aid, where necessary, of any other department in order to present the most complete case.

! Taught to Know Markets

Works. I was recently in the toolroom of one of the most enterprising engineering firms in the Midlands. Around me were some giant Swiss machine tools, beautiful instruments of precision and power. "Very expensive," commented the works manager, "but it's the firm with the best machine tools that makes the most profits." His job was to make goods, but he was thinking all the while about selling them too.

A great deal is talked these days about the importance of craftsmanship in industry, and as an exporting country we have thrived on craftsmanship for a hundred years. But only the poet with a private income can afford craftsmanship that is out of touch with the requirements of the consumer. Variations in a product may satisfy the sense of craftsmanship in the workshops, but they may be unjustifiably costly in calling for new shop lay-outs, different jigs and gauges, more specialised training, unless they are variations that help the sales department to dispose of more goods.

One of the functions therefore, and certainly not the least important, of the works manager is to steer a middle course between extravagance and parsimony, or to give such advice to the management as will enable them to do so. The best machine tools, the latest equipment, would of course make life more worth living, and after six years of all-out production with minimum replacements and repairs they may be urgently

tempered by a sensitive understanding of the problems of the market will it prove in the interests of the firm's selling programme.

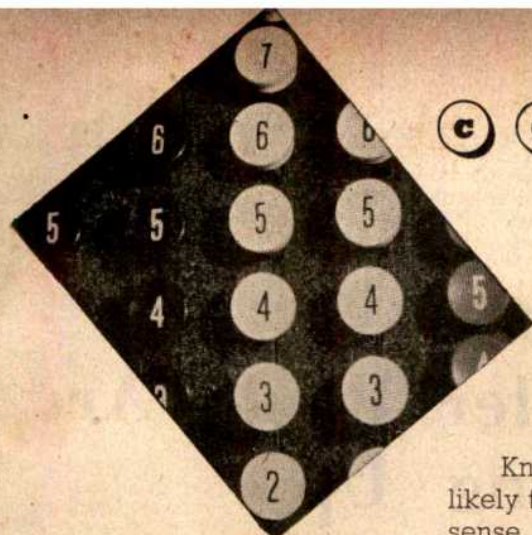
Personnel. Among the most enterprising firms the day has long since passed when personnel management was just a simple matter of hiring and firing. The development of this important managerial function has been carried several stages further, among very many firms, in the hot-house of war. But only in very few concerns has it yet been carried so far as to be regarded as one of the several facets of salesmanship. Yet, in common with other functions of management, that of personnel has its part to play in strengthening the sinews of the man on the road.

It Does Not Add to Costs

It is perhaps a counsel of perfection in these days to talk of the measures that should be applied in order to engage only the most appropriate labour for each type of work, yet only by securing the requisite skills in the necessary quantity can a manufacturer be certain of producing the goods the customer wants at the time and in the quantity that the customer wants them. To obtain that labour when manpower is still in short supply there is only one effective policy: to create conditions of work and welfare that will attract workers and, equally important, retain their services for considerable periods. It is bad economics from every point of view to have a constant stream of workers passing through the factory. High labour turnover means high costs which in turn means higher prices and consequently a deterrent to sales.

At the same time it should be recognised that it is not adding a burden to the work of the sales department to spend generously on training and apprenticeship schemes, covering all grades from executive to typist in the administrative department and from scientific specialist to labourer in the works. I know of one firm in the North of England that has its own training scheme for short-hand typists straight from school. They provide training in working time at full rates of pay over a period of six months, and although there is no guarantee that they will retain all the girls they train it is still considered well worth while in the long run. Only fully trained workers can produce the best goods at the lowest price in an economy that in essence has never ceased to be competitive and will become increasingly so in the period ahead.

Testing. Not every firm has its own testing department, although many apply some form of inspection, whether individually or by sample. In most cases it is regarded as an auxiliary to the production departments, with whose affairs it is mainly concerned. A more dynamic approach to the work of testing, however, is to regard it as a vital link between production and selling. If the work of the department is really thorough and



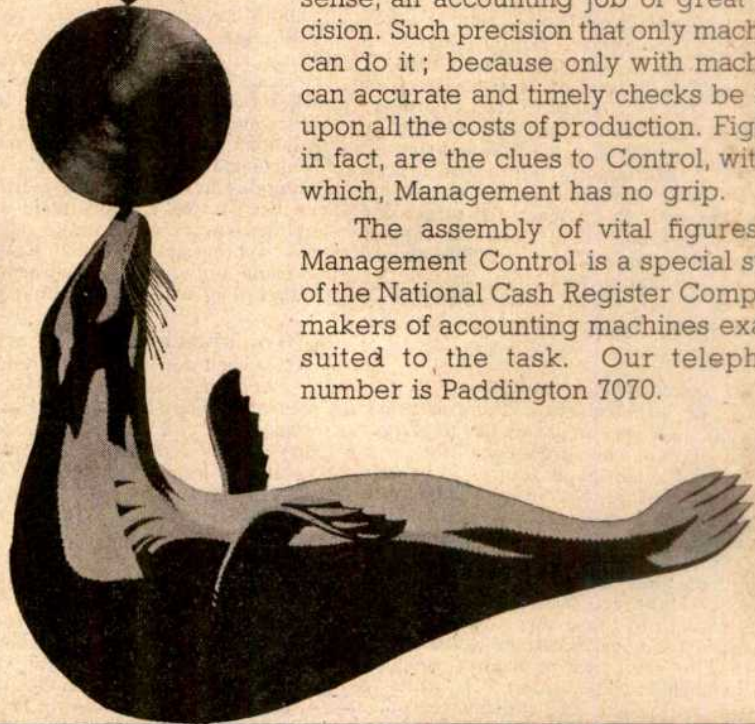
c o n t r o l

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dependable it can even be made the basis of the firm's advertising policy, associated possibly with some form of guarantee. Guarantees are an excellent and well-tried stimulus to sales, but they are apt to prove expensive unless given with a certain foreknowledge of quality.

Six years of shortages have had impacts on industry in a variety of ways, not least among them the undoubted increase in the discriminatory powers of the buying public. Rationing, pooling, temporary suspension of brand names, have all encouraged purchasers to depend on one guide alone: that of quality as demonstrated by their own experi-

ence. That habit will not easily be cast aside when the period of shortages passes. Britain has learnt to prefer the best, and in a world market of fiercely competitive trade only the best will permanently hold its position. Without a testing department, adequately staffed and equipped and given a clear directive as to its function in the organization, that all essential guarantee is difficult to give.

Here then are some of the ways in which other departments can assist the salesman. Manufacturers may find it an instructive and profitable exercise to enquire in terms of their own organization what other departments may be similarly regarded.

Britain's Order Books Are Filling Up

MR. H. A. MARQUAND, Joint Parliamentary Secretary to the Board of Trade, has forecast that the March exports will be found to have reached £67,000,000, as compared with £60,000,000 for February, £57,000,000 for January, and an average of £39,000,000 a month for the last quarter of 1945. If Mr. Marquand's figure for March is attained; and maintained for the rest of the year, we shall easily reach the target for the year of £750,000,000. It looks as though the old popular song which went "Things are looking up, no matter what they say: things are getting better, better, better every day" is coming true at last. Or am I speaking too soon?

WITH commendable enterprise, the Scientific Instrument Manufacturers' Association has set an example to larger trade associations by organising the first exhibition of British manufactures to be held abroad since before the war. The latest developments in British scientific instruments is the theme of the exhibition, which will be held in Stockholm from May 24th to June 4th, under the joint auspices of the Scientific Instrument Manufacturers' Association of Great Britain, Ltd., and the Royal Institute of Scientific and Engineering Research of Sweden. The new venture augurs well for Anglo-Swedish co-operation, for while a committee composed of eminent Swedish scientists were responsible for the local arrangements, British scientific instrument makers were invited to supply the exhibits.

TALKING of scientific instruments, I hear from a firm in South London that overseas orders for British mass-produced thermometers are pouring in with every post. The German trade, which was very extensive before the war, has practically ceased to exist. The U.S.A. produces a high grade instrument, very like our own, but only sufficient for home consumption. Now there is an

enormous demand for thermometers both from the liberated European countries and from still larger and wealthier markets in South America. It looks as though the entire world market for thermometers is in the hands of British manufacturers, provided they can get the labour. The firm in question anticipated this problem. At the time when Hitler was making his first claims for German supremacy, they started training their workers by a simplified process, cutting out the seven years' apprenticeship which was essential to the trade under the old system. I wonder whether they will continue that policy.

NEW BESTEC overseas agents are announced for Australia; Belgium; China, the Philippines, the Colony of Hong-kong, Czechoslovakia; Denmark, Egypt and the Sudan; Eire; Finland; France; Holland; Iran; Iraq; North and South Rhodesia; Nyasaland; Palestine; Spain; Sweden; Switzerland; Syria and the Lebanon; Turkey; the Union of South Africa; British West Africa.

AIRWORK LTD. (the air transport company that founded Heston Airport) have announced a "Flying Salesroom" service which will be of considerable interest to exporters. The idea is that Airwork will have a fleet of aircraft fitted out as travelling sales, display, and demonstration rooms accompanied by specially trained salesmen demonstrators. Each aeroplane can cover roughly 50,000 miles in each year, visiting approximately 100 towns situated in those countries to which, from the business point of view, it is most important to go. The exact method of operation naturally depends on the requirements of the manufacturers, but it is probable that each aircraft can accommodate goods of up to 25 firms, grouped as closely as possible according to the individual requirements of the manufacturers concerned.



Production goes 'Clockwise'

Greenwich time, runs 60 minutes to the hour—no more, no less. But *P.M.H. is variable and is increased by the installation of T.R. Time-Control Service. This system establishes a standard Factory time—to the eye, the ear and on the records. In addition it 'exposes non-productive time and provides the basis for dependable Costings. In T.R. equipped factories production truly goes clockwise and like clockwork.

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*Installation Companies in London, Birmingham, Bristol, Cardiff, Leeds, Manchester
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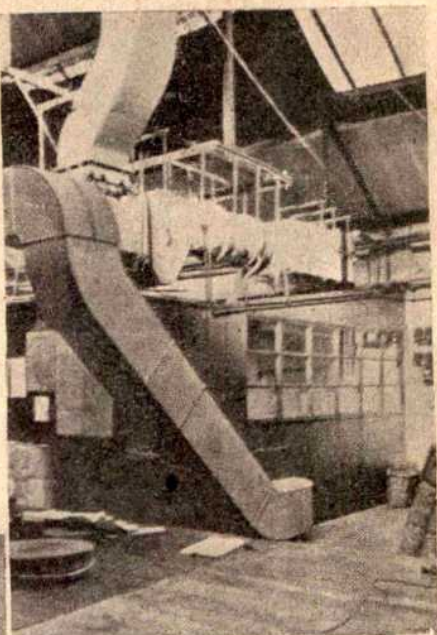
Air Must Be Controlled and Uniform at Research, Process & Testing.

By L. G. W. GOSDEN

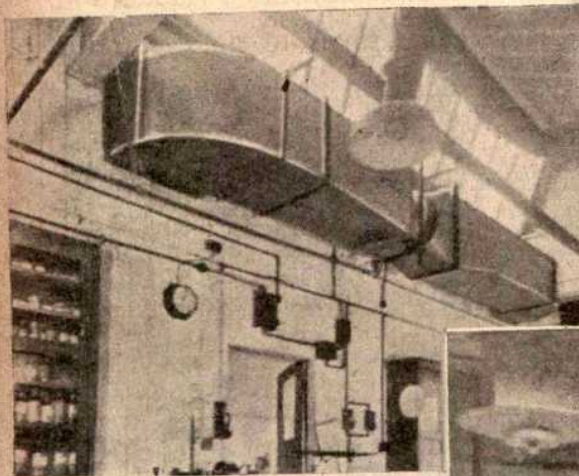
WHILST war is recognised as being one of the most futile and great destroyers known to mankind, and is being rightly outlawed by all level-minded people, war—and the latest one in particular—can be the cause of considerable education. Much new information has been gleaned on the physical composition of a wide range of materials. This information was required in order that we might know the adaptability of various materials to entirely new uses and industrialists were not a little surprised and interested to gain information previously unthought of.

Just prior to the war, many manufacturing processes had been carried on by "rule of thumb" and the practice of our grandfathers was blindly copied, with a narrow line of vision being shown in the application of the product.

To-day, however, we find that there is a wealth of new information available about what appeared at first sight to be quite commonplace commodities—cotton, wool, silk, leather, elastics, paper, cardboard, timber, plyboards, rubber and a variety of foods—to mention a few.

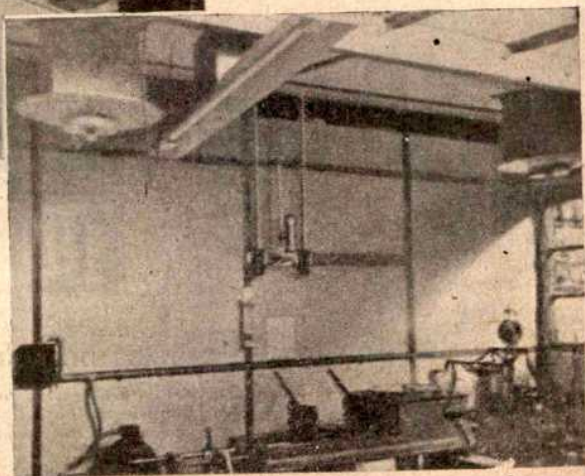


Above, a stage in processing elastic webbing. Left, the Research Laboratory and below the Testing Laboratory. If research demands are given air and temperatures, processing without them reveals defects at the testing "inquest"



Photographs by courtesy of
Mellor, Bromley & Co., Ltd.

Each have chemical, physical and mechanical qualities which will vary with seasons, crop, animal and variations in daily production, and it is necessary for the industrialist to-day to have a thorough and complete knowledge of the physical and chemical qualities of his material, in order that he may be able to comply with specification, compare his finished product with his competitors' and generally improve its qualities.



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Furthermore, his research leads him into channels which promote new markets, and he is enabled to specify the performance of his material under different conditions of climate, whether tropical, temperate or arctic.

The tests of his material are carried out in his research or testing laboratory, but he can only obtain reliable information provided all his tests are comparable, and made under uniform conditions of temperature and humidity. This is essential where the materials are hygroscopic or responsive to fluctuating weather conditions.

The laboratory is kept at a constant set of temperature and humidity conditions, enabling all results of tests on samples to be comparable. Such air conditioning plant should be so installed that by simple adjustment of the thermostatic controls a wide variation of weather conditions can be maintained so that a knowledge can be acquired of the performance of materials in different climates.

For instance we need to know the elasticity of a material, together with its breaking load, its flexibility or bending moment and its frictional resistance to rubbing and abrasion, in addition to its general chemical composition.

Many industries to-day are supported by their Trade Test or Research Association, which not only lays down the standard specification, but also supplies special information on individual samples submitted to it.

In addition to this however, we find that even "small" firms have their private labora-

tory where all this information can be obtained. Again various machines can be taken periodically from the production lines into the laboratory for temporary experiments on new methods of production.

Wherever industries are handling a hygroscopic substance, however, we would reiterate and emphasise that the results are useless unless such tests are made under known conditions of temperature and humidity, the fact that the material is in balance with these weather conditions and also that the conditions are being maintained constant during a range of experiments.

"Any old type" of air-conditioning plant will not do. It must be designed as a "tailor-made" job, with the designer having a full knowledge of the room, its heat losses and gains and its general susceptibility to outside weather conditions. It is essential that efficient plant should be installed to ensure a constant temperature and humidity with practically no variation during night or day, uniform throughout the room.

This involves a continuous, satisfactory air circulation, employing both heating and refrigeration, cutting in automatically with the seasonal varying temperature load, with humidifiers, or again, refrigeration for de-humidification.

Particular attention is paid to the types and application of thermostatic and humidostatic controls, for on their accurate and reliable performance depends the bringing into play of the various components of the complete installation.

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LOOK AT IT THIS WAY

Today a character called Chad pops a Cyranoesque nose over pencilled walls and pawkily asks 'Wot! No...?'

Chad reacts only to the things that should be here, but are not. About the things that should be here and, in fact, *are*, he makes no comment. He takes them for granted, as do we all. Chad, therefore, is mute on the subject of Electricity; it is not within his province.

'Wot!... No Electricity?'

One could doubtless chad quite easily on certain aspects of its vast and varied service. But Electricity as an efficient, progressive institution... well, when you flip the light-switch in your office, when you click on the electric fire in your home, *something happens*—instantly! If it did not, then we should see chadding indeed.

It may be said that once one understands the principles of Electricity the rest is just a matter of generating, wiring, and good organisation on an immense scale. But if all this did not progressively get better and better, then Mr. Chad, and his human counterparts, would inevitably, immediately, and vociferously want to know, 'Wot about it?' The point is that it *does* progressively get better and better.

'Well, the war's over now'

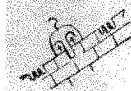
Yes, it's peace-time... So look a little harder over that wall of yours, Mr. Chad. Already many home appliances are appearing in the shops. Mrs. Chad will tell you that she now has her electric kettle, that soon her name will come up on the list for your new refrigerator. She knows that (things being what they are) she must go easy on the electric fire, but she also knows that she *can* switch on and get heat... just like that! You know that the pylon-held cables continue to bring more and more of this strange, taken-for-granted commodity called Electricity, that the master-switch in the biscuit works, works! That fluorescent lighting is appearing in offices and factories everywhere, that something is being done, and always will be done, about electrical improvement.

... It's just a thought, Mr. Chad... and if you are thinking about the statement displayed in the other part of this page, do not regard it, please, as just a slogan... it is a *fact*!

ELECTRICAL DEVELOPMENT ASSOC.
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ELECTRICITY

... wonderful thing!



How Much Does Floor Space Really Cost You?

The Author of this article reveals that a recent survey proved that prodical space use took 16% of total productive time. Replanning saved the factory 27,500 man hours. He tells us how they did it

By PETER DRYDEN

HOW to find the cost of floor space? Management knows full well what the plant as a whole costs; rent or depreciative allowances can provide *that* information. The profit leaks, however, will never be found unless a formula is produced that will demonstrate the profit—or loss, actual or potential.

Today there are two schools of thought regarding the utilisation of floor space; one is that the workshops should be airy, spacious and allow ample freedom of movement; the other is that minimum space should be allocated to productive processes compatible with effective output.

Sheer economics would indicate that the latter is the criterion. However, there are factors to be considered; for example, the mobility requirements of the components, the siting of the stocks, the linking of machines, the provision of power; all these have to be taken into consideration for the proper assessment of floor space.

Factory space (and office) requires to be worked on, lighted, heated, cleaned and ventilated. These are basic requirements. With-

out considering these, however, floor space costs money either in the form of rent or in the cost recovery factor as demonstrated by depreciation and maintenance.

From the above can be seen that already a picture is emerging that will indicate the direction to be taken for the proper assessment of its costs.

There is one crushing case against the spaciousness policy advocated by its adherents, *that is the cost of indirect labour*. For every foot of spaciousness, *i.e.*, space not being productively used, not only do the costs total against it but material has to be trucked that much more. This is a most important factor. The picking up and putting down of material will cost approximately the same under any conditions, the distance to traverse however ties up material in transit, labour in travelling and the use of conveyances.

A recent survey in a modern factory revealed that in the machine shop alone, the trucking of components and raw material came to 16 per cent. of the total productive time. The replanning of this shop cost in

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The Need for **Ediphone** *Dictating Machines* is *Greater* *Than Ever*

The energy we have poured forth in the dangerous years now behind us will have to be matched—even surpassed—in the constructive period ahead. Management is faced with the demand for shorter hours yet greater output. The Ediphone Dictating Machine was designed for such conditions for it dispenses with unnecessary operations and prevents frustrated thinking. Your instruction, plans, letters, anything you wish, are recorded at the time you think them—you just press a key and speak—your words may be transcribed at any future time it suits you.

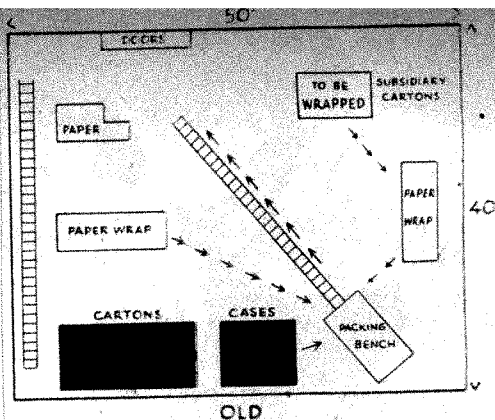
There seems little hope yet of being able to supply our machines unrestrictedly and we appeal to all who have Ediphone Dictating, Transcribing or Shaving Machines they can release to advise us. We can place them where the capacity for labour-saving will be utilised to the full.

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execution £300. The total man hours saved in transport totalled in one year 27,500 (i.e., from sixteen operators to five) which at an average rate of 2/- per hour totalled £2,750.

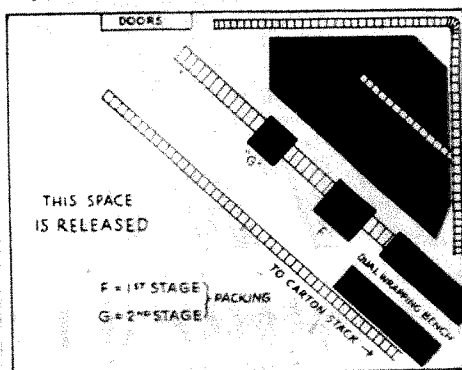
More important than the mere cost of this was the fact that all these hours were released from non-productive work for actual direct production.

Peak output can only be attained if the following requirements are satisfied:—

Storage.—Ease of access to floors, ease of access for stocking; positioned to avoid long hauls. Preferably on an outside wall for lorry or truck deliveries without disturbing processing.

Processing.—Close batching for ganging where required, machines to be backed to gangways for ease of maintenance. Limits to be solely governed by material, i.e., length of stock bar for capstans; length of strip run for presses. These to be backed on gangways so that material clearance does not interfere with the machining cycles.

Progress.—This is a prolific cause of floor waste. It will be obvious that if the progress department is not right on top of its job, accumulations of material will clog the flow lines, this will take up floor space for storage, will create expensive "resting" time and also will involve extra labour in overflow storage. Fixed loading points, conveyors, gravity chutes and mobile stackers all will help in reducing the floor space required.



NEW

BUSINESS

Addressall MACHINE COMPANY



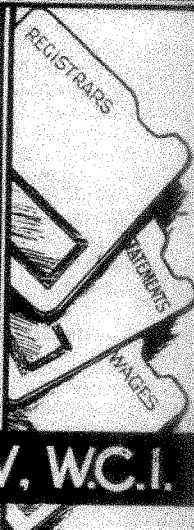
A few reasons why you should investigate this One Unit Addressing System.

- No expensive, noisy and cumbersome machinery to purchase to be self-contained.
- Prints face up—complete control of all operations.
- Forms a Card Index in addition to an Addressing or Listing Service.
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No matter what your name or data writing problem may be—ADDRESSALL has the solution.

We have a model to cover every known requirement in the mechanical production of Addressing or Listing work. Hand, Foot and Electrically operated.



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HOLBORN 35717

GOODS BY RAIL

**BAD PACKING AND FAULTY ADDRESSING CAUSE
LOSS AND DAMAGE**

Please . . .

- ★ Use containers strong enough to withstand ordinary transit conditions.
- ★ Use strong white labels affixed securely with addresses in black block letters or type.
- ★ Address packages fully and show postal district and/or number, e.g., London, E.C.2. Manchester 17.
- ★ Place duplicate addressed label inside each package.
- ★ Remove all old labels and conflicting addresses.
- ★ See, in the case of full truck loads, that name of sender and/or consignee is also indicated by labels placed inside the truck, or by labelling one or more packages adjacent to the doors.
- ★ Type or write consignment notes distinctly and enter particulars fully and correctly.

. . . help us to help you

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Administrative.—Personal pride and self glorification invariably causes this to be an unnecessary oncost. The supervision usually starts off with an exposed bench post as the administrative centre. In a relatively short time, offices have been built and junior supervision have followed suit by creating their own centres. Except as a noise baffle, offices have no place in the production shops. Higher supervision should have their offices for thinking, creating and interviewing in an administrative block away from the shops. Offices on the floors, block light, limit flow planning, reduce overall supervision and create *les cordons sanitaires*.

Packing and Dispatch.—Far better to let the lorries and railways act as storage *en route* than to have bulk tied up in the department. Planning should indicate the frequency of clearance in order to avoid stacking up. The ideal is to pass the goods straight through the dept. and save handling than be involved in spending money on merely picking up and placing down.

Getting the Data

An early requirement is to discover the labour costs involved in maintenance, servicing; to establish the power, heating and lighting costs (in this connection, the costs of the appliances per foot should not be overlooked, nor the cost of bulb and tube replacement).

Rent and/or the cost recovery factor should be added and the total divided by the plant area and office and ancillary functions.

This gives a total cost per foot.

Break this figure down to production and non-production figures and the comparison will demonstrate the proportionate costs per foot. It should, in theory be in similar ratio to the oncost/direct costs, in actual fact, using this method of analysis, it will invariably be discovered that the cost of the non-producing floor space is out of all proportion.

Analysed departmentally, an aid to efficiency is given by directing the spotlight on to those departments with the highest non-productive space. Here is an example:

Assume an average yearly cost of 3/4d. per foot for all the above factors and an average sized factory could reveal the following costs as shown on page 88.

It will be seen that the indirect floor cost exceeds the direct production by 63.8 per cent. *But*. In the manufacturing shops themselves 12,000 feet of space is not being used for production, but rather as a supplement to stores, so by this simple analysis it is revealed that the stores are not costing £1,000 but in fact £6,166. The analysis likewise reveals that the Works Office and the administrative blocks cost the same. Which considering the differing numbers employed in each section is hardly justified from the viewpoint of industrial efficiency.



Achilles

**He thought he was
completely protected
but - - -**

the arrow found his weak spot! YOU can be fully protected from the arrows of misfortune which so frequently find their mark when least expected, if you place your insurances in the hands of the "Midland Employers"—an independent company that provides for all individual requirements.

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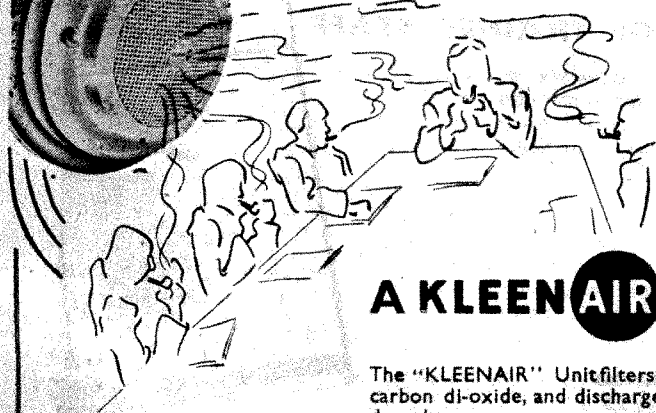
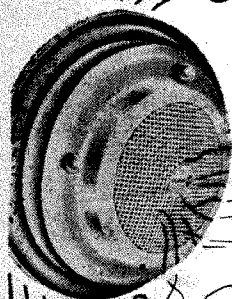
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Conditioning Unit will
clear the atmosphere
for frank discussions.

The "KLEENAIR" Unit filters dust and smoke laden air, eliminates carbon di-oxide, and discharges pure air into the room without draught.

Admirable for offices, lounges, kitchens and sickrooms, etc.

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Floor space costs per ft.

Dept.	Prod. space	Non-Prod. space	Cost in £'s	
	(a)	(b)	A	B
M/c shop	12,000	3,000	2,000	500
S/Assy.	8,000	4,000	1,333	666
F/Assy.	11,000	5,000	1,833	833
Main Store		6,000		1,000
Works Office		12,000		2,000
Admin.		12,000		2,000
Canteen		3,000		500
First Aid		800		133
Yard & Drive		1,000		833 (50%)
Totals	31,000	46,800	5,166	8,465

Replanning the sites will do a great deal to plug these profit leaks. By improving the progressing, the production shops should be able to release space taken up by storage, by the streamlining of the processing, at the very least, 10,000 feet could be released and in fact this could easily absorb the sub-assembly department in toto.

As an indication of such replanning, the sketch (fig. 2) shows how a packing department was relaid. The "spaciousness" school would say that the old method was good layout since there is ample manouevring room. True. But what a waste of time in walking to and fro! By adopting the flow-line principle for packing, merging the various stations and installing another conveyor

line, not only was 48 per cent. of the space released and, on the figures quoted above, £160; but the labour force was reduced from twelve to eight, which on one year at an average rate of 2/- per hour gives a gross saving of £1,000!

Tips For Sales Team

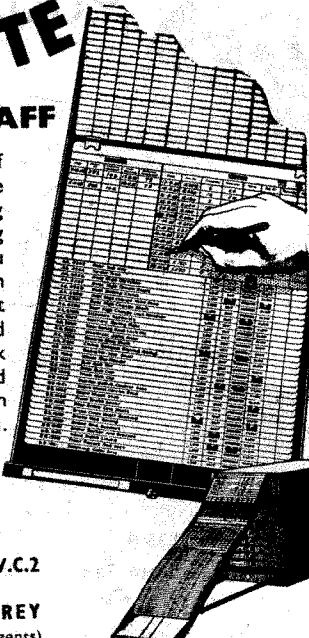
AN address to the Industrial Section of the British Psychological Society by R. W. M. Krauss on "Some Psychological Views On Retail Salesmanship" contains several tips for salesmen, not the least useful of which are three connected with the showing of dress material. Mr. Krauss makes these recommendations to the salesman: (1) Take care the different articles which you show do not influence each other in an undesirable way; (2) Avoid presenting too many of them to the customer at the same time; (3) Keep in mind her limited capacity for selecting individual things from a variety which you present to her. Therefore hide from her what she apparently dislikes and show only those articles for which she has shown preference.

If these points appear a little obvious, visit a few provincial stores and watch what happens. It will be found that there are a good many salesmen and saleswomen who could learn something from Mr. Krauss.

B.C.

A SHEER WASTE OF TRAINED STAFF

—especially in these days of labour shortage—to continue with out-of-date time-wasting office methods. By installing Shannon Visible Records you obtain increased control with lower labour costs; you get instant access to vital facts and figures and more essential work per hour from your staff. Send for leaflet showing how Shannon Visible Records can help you.




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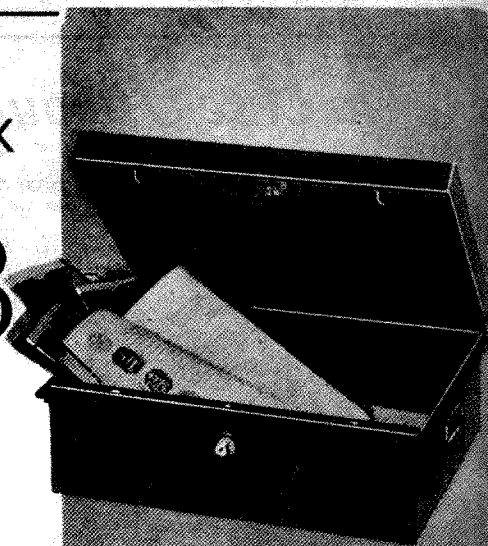
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by
CHUBB

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The modern silvery crackle finish and chromium lock face give these boxes a distinguished appearance.

Now on view at our showrooms and at Harrods, Aspreys, Fortnum and Masons and most of London's famous stores.



Further details from

CHUBB & SON'S LOCK & SAFE CO. LTD.
68 ST. JAMES'S ST., LONDON, S.W.1

"YOU CAN TRUST IN A CHUBB"

COMPLETE WAGES RECORDS

Continued from page 60.

bonus earned to arrive at the gross pay and balance these wages with the relative job cards.

After the Income Tax is inserted, as described under the P.A.Y.E. part of this article, and the net wage ascertained, the pay cards are then listed on the pre-prepared payroll. The job cards, which have been previously punched, are sorted and analysed to departments and Direct Wages and Indirect Wages within each department.

The Indirect Wages are sorted into standing expenses, such as Idle Time, etc., and totalled on a Cost Summary slip post card and hung up in the Cost Summary.

The Direct Wages are sorted into job numbers and are summarised and totalled on a slip post card, and hung up in a visible pack.

The totals of each direct job are summarised, added with the total of Indirect Wages, and this total balanced with the total amount of gross wages on the payroll of each department.

In order to execute the pay roll and wages job costs in the minimum of time, program-

ming and scheduling are essential, and the work of the Timekeeper, Wages and Calculating staff must be timed so that their duties and activities follow each other in interlocking rotation so that these job cost analyses are completed in one hour after the pay roll is completed.

Those workers who are employed on non-productive work such as Storemen, Inspectors, etc., only clock on one card during the week, and this card is slip-posted with the pay card so that no clocking of time is necessary.

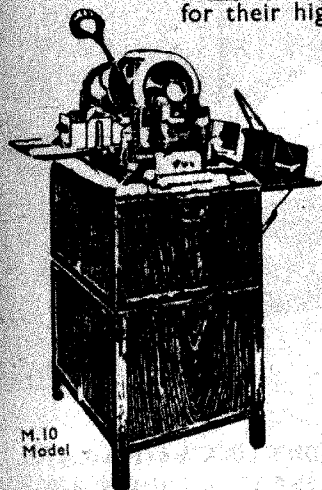
It may be said that the examples cited are of a large company, but there is no reason why the same principles and the same speed of calculating and putting up wages could not be obtained whether the pay roll consists of 100 men or 1,000 men.

It will be noticed that there is a large percentage of work prepared before the bottleneck at the end of the week, the pay cards being printed on the Monday of the week previous to the working week, while the pay roll is also prepared beforehand.

A duplicate consisting of the "workman's name portion" of the pay roll is used by the timekeepers as a covering list when they are sending to the Calculating Department the pay cards and the job cards, thus ensuring that all documents are in the same order as the pay roll.

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The M.10 Automatic Electric self-feeding Rotary model will reproduce perfect copies of any document required at the rate of 40 to 120 copies per minute.

Speed, Economy and absolute precision of work are outstanding features in its manufacture.

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BRANCHES IN PRINCIPAL TOWNS THROUGHOUT GREAT BRITAIN.

Findex REGD

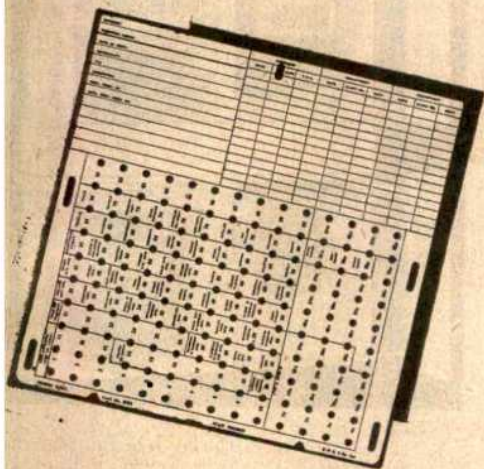
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**Permanent or Semi-permanent
Records.**



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and, if possible, let us have
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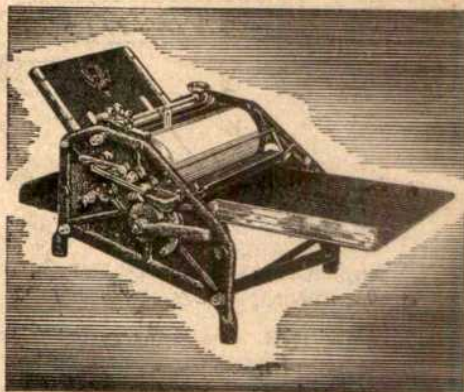
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LABOUR SAVING. The buying, recording and affixing of stamps is entirely eliminated.

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*We invite you to write for full particulars
and will gladly advise you on the selection
of a suitable model for your needs.*



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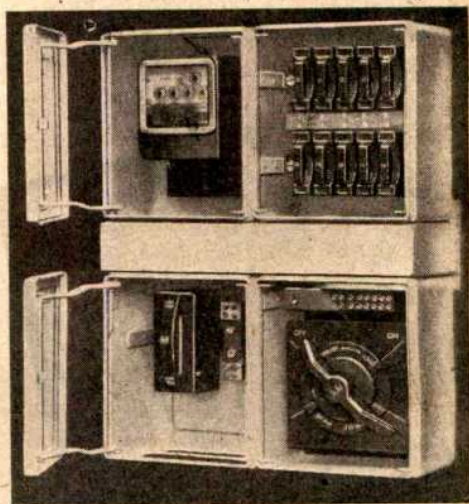
and at MANCHESTER & BIRMINGHAM.

new For the Factory

18.—For Better Distribution

IN view of the wide progress that has been made in the design and use of electrical gear, it is remarkable that untidy schemes for the intake and distribution of electricity, embodying loose gear and trailing cables, still persist. Last month we described one new unit that eliminates trailing cables. Another is the Carlisle Electrical Manufacturing Company's "Cemdu" distribution unit. Here are six of its 12 special features:

(1) All equipment is totally enclosed. The intake cut-outs, meter, main switch and distribution fuses are contained in individual sheet metal boxes. The wiring and inter-connecting cables are also contained in sheet metal tubing.



(2) The sheet metal boxes are uniform in size and therefore positions of individual apparatus can be interchanged to suit requirements.

(3) Interiors of boxes are protected against dust and damp and efficient earthing arrangements are provided.

(4) Doors are fitted to the boxes for easy access, and sealing arrangements are provided for the intake box. These doors are easily removed and can be placed to open either left or right hand.

(5) The rotary pattern main switch is of entirely new design and most efficient in use and of liberal rating. Rewirable fuses can be incorporated if required and the design of the switch provides facilities for the re-wiring of these fuses in a very simple manner.

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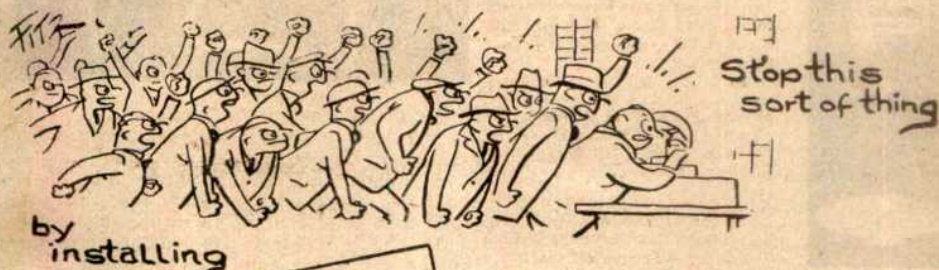
Further: 'Photostat' enables every executive and expert engaged on a job to be presented simultaneously with a complete set of documentary material. That saves a good deal of the 'passed-to-you-for-information-and-return' kind of delay.

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TRADE MARK
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RECORDERS**
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BY ONE HAND OPERATION



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 LGH 113.

New Clip-on Bed Light with switch
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 red or green candle. 17/6 plus 3/10
 Purchase Tax (without shade). Cat.
 No. LGH 318.

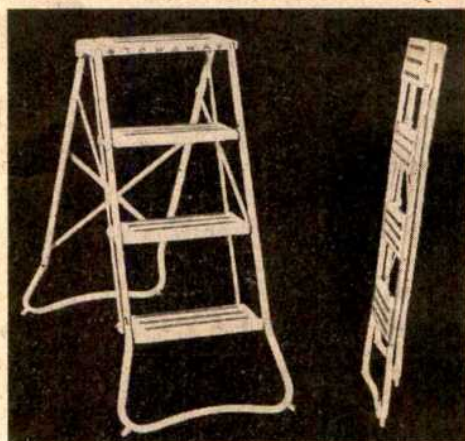
Mirror Halo Bowl Pendant 18"
 diameter. From 27/9 plus 6/2 Purchase
 Tax. Cat. No. LGH 269285.

L. G. HAWKINS & CO. LTD.,
 30/35 DRURY LANE, LONDON, W.C.2.
 Telephone—Temple Bar 5811.

(6) The distribution fuses are of the new and novel Carlisle Electrical "Latralok" design and are rewirable. These fuses have very robust contacts and incorporate a unique self-locking device which ensures permanent contact under all circumstances.

19.—Stowaways

THE "Stowaway Stepladders" marketed by Douglas-Kenn Ltd., are of all metal tubular construction and have three, four, and five treads. Exceedingly strong but light in weight, they are ingeniously designed to fold flat to approximately 1½ ins., the treads collapsing to a vertical position and thus enabling them to be stowed in the minimum space.



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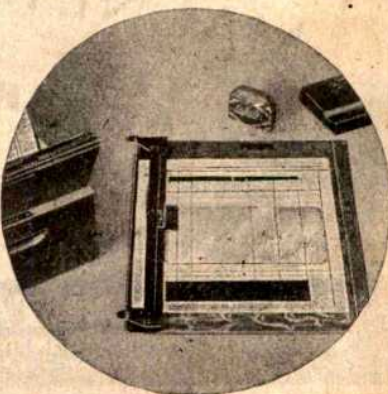
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"HARVEY" Steel Equipment is portable. It can be dismantled and re-erected by unskilled labour without any depreciation whatever. NO fixing to floor or ceiling is necessary.

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WHERE **SILENCE**
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The patent lining
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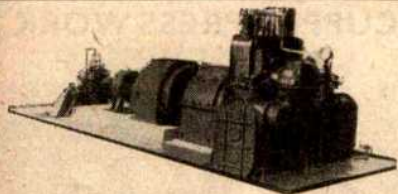
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Write for Bulletin BP 131

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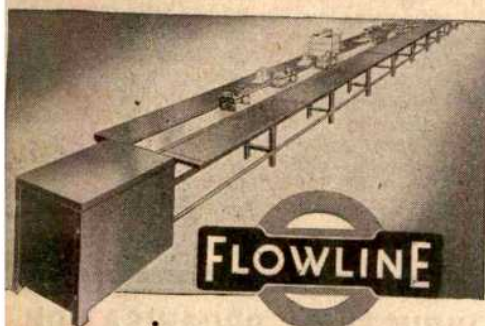
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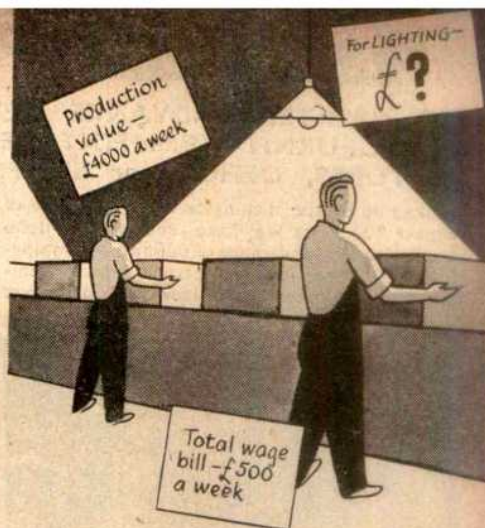
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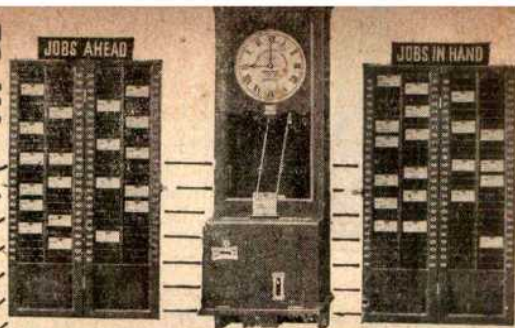
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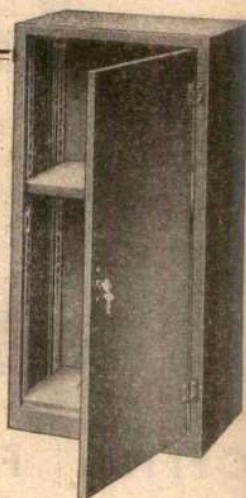


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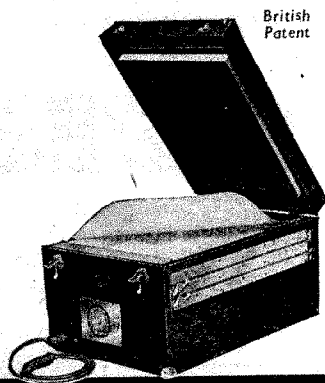
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SIX MONTHS

Continued from page 45

easy to realise that any go-ahead management in a similar predicament would most certainly be aware, in some degree at least, of a sense of frustration.

To Lines Bros., the search for the new and the novel is the dynamo of success. The company has always been on the lookout for new processes and better methods, but many of the new and novel designs and attractive toys will be held up in production until designers and technicians are less restricted than at present. As for materials, wood and steel are basic. Plastics to the toy trade are not new but their uses are to some extent limited.

At the end of my tour I was conducted through a section of the assembly shop building up model cars. My attention was drawn to the fact that the conveyor line reached a dead party-wall and turned back on its tracks in order that the operators should complete their successive processes.

Behind that wall, lie other parts of the factory still to be reconverted. There, still lies a good deal of wartime stock. The firm want this cleared away. They want that assembly line to run straight and true without any doubling back. They want the flow of output made smoother. I wondered whether that wall was symbolic.

If that symbolic barrier can be cleared away and the obstruction removed, then this firm, within a year, could effect a 100 per cent. reversion and by next Christmas perhaps, there will be more to be seen in the toy shops of the home country.

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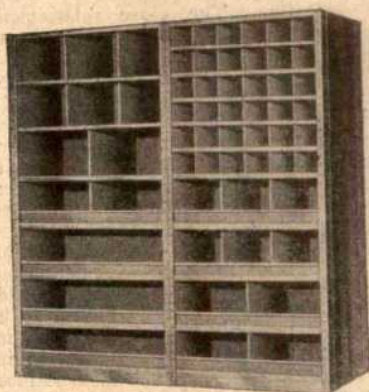
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Health- in Industry



How to Map Out Your Factory Hygiene Campaign

By SHAUN CLEAVE

SINCE the early years of the last century there has been a steadily growing recognition of the effects of environment on man. The appalling working conditions created by the Industrial Revolution shocked a certain section of the community into public outcry. These humane folk provided the first impetus towards our present standards of hygiene and sanitation. The close relationship of cleanliness to health and well-being is now accepted by all enlightened people.

The employer of today can no longer be regarded as a man who merely engages a number of other human beings to work in his factory. He is in fact an important social worker who must finely balance the material considerations of efficient production with the human obligations he owes to his employees.

At least four-fifths of the 1937 Factory Act will be seen to be devoted to matters of cleanliness inside the factory. In addition detailed pamphlets giving guidance on all matters of sanitation and hygiene are issued by the Government for the benefit of industrialists. There is even an Industrial museum in Westminster containing the latest types of sanitary fittings and other applications of knowledge discovered after much research into factory hygiene. Yet it is not new methods that are required so much as a conscientious application of generally recognised standards of cleanliness.

Any employer who wishes to feel confident that he is doing his utmost to establish a good tone in his factory would do well to first make a comprehensive survey of all the hygienic and sanitary arrangements throughout the works. That is to say he will consider the position and arrangement of cloakrooms, lavatories and washrooms, and drinking fountains and also the methods of lighting,

heating, ventilation and cleaning which exist in the factory. These may be regarded as the focal points in his factory hygiene.

Let us first look at the cloakroom which is the first place that the employees go to on entering the works in the morning. A cramped, dull room with no heating facilities is scarcely a stimulant for a good day's work. Why not an airy room with adequate space allowance per person and hot pipes to dry wet clothing? It may be that special protective clothing has to be worn for work, when ample space for the changing of clothing is even more necessary. If the clothes hangers or pegs are too close together free ventilation round the clothing is prevented and a typically stuffy atmosphere results.

A low bench running alongside each row of pegs will enable the employees to sit down when changing their footgear, and if the inside of this bench is partitioned along its length it may be used as individual lockers for workers' shoes. Light-coloured washable walls are best for the cloakroom whilst the floor can be of linoleum or wood, both of which are easily cleaned. In some very 'dirty' trades a stone floor with a gulley to facilitate hosing is found to be more satisfactory.

Natural ventilation by means of windows and ample grid inlets is best. If hot pipes run round the lower part of the walls of the cloakroom they will warm the incoming air from the grids, which should always be ample in size to avoid draughts. Waste paper boxes in these rooms will encourage tidiness and a cocoanut doormat outside the entrance will be appreciated by the employees and the cloakroom cleaner alike. Provide about two large mirrors if possible in the women's cloakroom. Their traditional pride

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of appearance cannot go unsatisfied and peering into pocket mirrors wastes much more time.

A drinking fountain in the cloakroom is a good idea. The best type is that where the drinking jet issues from the back of the basin, thus avoiding the risk of contamination. The main distribution of drinking fountains, however, is usually in the workshops themselves. If it can be arranged to have a responsible cleaner on duty in the cloakroom at all times when it is not kept locked general tidiness and order will be easily maintained.

The main lavatory for each sex is best situated adjacent to the corresponding cloakroom. This arrangement will be appreciated by the employees as it will save them much time when they finish work. For reasons of privacy the lavatories should never open directly into workshops. It is also important for hygienic reasons that their windows should communicate directly with the open air.

Whatever kind of washbasins are fitted the main point is to provide a sufficient number of them to enable all workers to wash in comparative comfort in the time allowed them for this purpose. Liquid soap seems as economical and satisfactory as any and one container can be placed between every two washbasins. If roller towels are used they have to be changed very frequently, but many firms prefer to provide rolls of absorbent paper towelling which are hygienic and save

laundering. These paper towels can be thrown into a special container after individual use.

Regulations require the provision of one lavatory for every twenty-five persons of each sex employed. Naturally there are obvious advantages in having more lavatories than the minimum stipulated. One of the best types of lavatory seats for factory use is the horse-shoe shaped plastic type which minimises the risk of contact with moisture left on the front of the seat. The flush should allow rapid repeat and efficient flushing of the pan, and is best effected by a downward-pull plug cased in a stainless steel tube to within four inches of the handle. Most of the recent gadgets for manipulating lavatory flushes fail to withstand the strain of frequent and diverse handling.

Prevention Better than Cure

The daily disinfection and thorough cleaning of the lavatories is a highly responsible job and deserves to be as well-paid as any in the factory. Scrupulous cleanliness here is vital to the self-respect of the firm and some employers insist on it being a full time job for their most reliable cleaner. A high salary and the official title of Sanitary Maintenance man would surely attract responsible men and women to such work. In addition to the main lavatories there are usually smaller conveniences throughout the various parts of the factory according to the number of employees. In all, the same high standards

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Extract from the MINISTRY OF HEALTH BULLETIN in the Pharmaceutical Journal, 5/1/46.

"The dust problem in the home is reasonably well known to everyone. Much less is generally known of the dust problem in factories . . . Dust and dirt harbour disease . . . In so far as factory dust is just ordinary dirt, factories need regular cleaning in the same way as homes, and the Factories Act requires every factory to be kept in a clean state, accumulations of dust to be removed daily from floors, workbenches, staircases, and passages, and floor to be cleaned at least once a week by washing or other suitable and effective method."

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of cleanliness must be kept, if the firm wishes to set a good example to the employees.

In the workshops, whatever their age, size or shape, ventilation and lighting must be the first consideration. The principle object of ventilation is primarily the stimulating effect of moving air on the skin. A desirable working atmosphere has been said to be one that is:—

Cool rather than hot.

Dry rather than damp.

Diverse in its temperatures in different parts and at different times (and, which is intimately connected with the latter)—

Moving rather than still.

The products of respiration and combustion which, to a smaller or larger extent, vitiate the atmosphere of any workshop can be efficiently and continually removed by a cross current method of natural ventilation. It has to be remembered however that both inlets and outlets employed in this system must be ample in size to avoid draughts. Natural ventilation is in nearly all cases preferable to artificial methods, which are either of the extraction or propulsion types. In some trades it is essential to have, in addition to the main ventilating system of the workshop, an exhaust system by which injurious dust or fumes are removed at the point of production. Whenever it is necessary for artificial ventilation methods to be used all the necessary equipment requires regular and careful maintenance. Clogged-up ventilating shafts and temperamental fans are useless.

Good lighting soon shows up any accumulations of dirt, prevents eye-strain and, if it is natural, provides the germicidal effect of sunlight. Whenever possible workshop windows should extend right up to the ceiling to allow the maximum benefits of daylight. The effectiveness of windows as a source of light in factories is often wasted because it is nobody's job to clean them!

Even antiquated workshops can be kept hygienic and pleasant if there is a regular system of damping and sweeping floors, and cleaning of ledges and windows. Waste paper boxes should be well dispersed throughout the shops and the "litterites" persuaded to make a habit of using them. This brings us to the question of personal hygiene. The employee who nonchalantly spits on the workshop floor or who wears his dirty overalls for weeks and weeks is decidedly anti-social. Some responsible person, as for instance the foreman, must speedily dissuade him from these habits. But it is well to realize that not everyone has been taught good personal habits and that in a factory where hundreds may be employed it is essential for one standard of cleanliness to be firmly established and maintained. Adequate washing time for all employees before meals and a system whereby the employer takes responsibility for the weekly laundering of workers' overalls—it is on such points as these that the "tone" of a factory depends.



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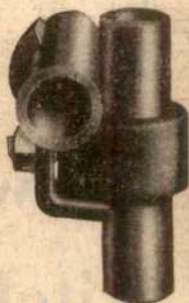
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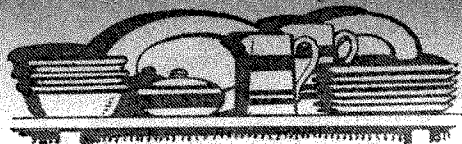
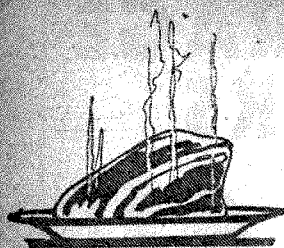
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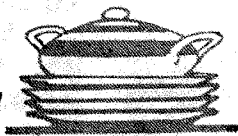
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Canteen



New Machine Brings Kitchen Facilities Plus

By "GADGET"

UNKNOWN to the man in the street, the constructive brains in industry have found time through the past few years to devise innumerable innovations which it was hoped to produce as soon as conditions permitted. It is amazing, to say the least, to have a pre-view of the many productions which are now past the drawing board and testing stage.

In this new series of articles, I will endeavour to draw the curtain for the benefit of those interested in new labour-saving machines, gadgets, and ideas, and give my impressions and re-actions to demonstrations of worth while appliances.

One would have expected manufacturers to recommence where they left off, but readers will soon realise that the years of war have made no difference, unless it be that they have keyed up the brains of the "back room boys" in the catering appliance business to the degree that they are now almost a score of years ahead of 1939, instead of the six years ahead if progress had proceeded at the pre-war rate. This month, I propose to describe a machine of which I had a recent private demonstration. Production is just commencing after exhaustive experimenting and testing, and the machine demonstrated was the first completed and perfected model, almost "hot" off the lines.

The machine is an electrically operated appliance, suitable for cafes, restaurants, and works canteens catering for about 200. The product is described as a universal food preparer, but I could most adequately describe it by saying that it does everything in the kitchen except cook and wash up! With the

addition of the various attachments, these are the various jobs which the machine carries out:

1. Mixing (whisking, kneading, beating).
2. Vegetable peeling and washing.
3. Bread cutting.
4. Butter making.
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6. Ice cream freezing.
7. Drink emulsifying.
8. Breadcrumb crushing.
9. Coffee bean roasting.
10. Fruit stoning.
11. Apple peeling.
12. Apple coring.
13. Grating.
14. Meat slicing (with running holder).
15. Sausage making (in conjunction with mincing).
16. Milk separating.
17. Bread cutting and buttering.
18. Fruit crushing.
19. Bean slicing.
20. Mincing.

Having in the past used and tested out many new types of machines and gadgets, and as a result acquired the habit of expecting and probing for defects, or points overlooked, I attended the demonstration in a very sceptical frame of mind. The inventor and director of the Company was present to answer questions, so after a brief description, I propose to deal with the points I raised.

The machine, as seen in the accompanying illustration, has a streamlined effect, and the



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12. Apple coring
13. Grating
14. Meat slicing (with running Holder)
15. Sausage making (also Mincing)
16. Milk Separating
17. Bread cutting and Buttering
18. Fruit Crushing
19. Bean Slicing
20. Mincing

**THIS
BRITISH
MACHINE
DOES
MORE
THAN
THESE
TWENTY
CANTEEN
JOBS**

colour is cream. The entire motive power is enclosed. The motor is $\frac{1}{4}$ horse power, and may be plugged into an ordinary lighting socket. Although preferable in a fixed position, screwed down to a table, the machine may be used as a portable unit. A most ingenious method of fixing the attachments has been devised, and it takes only a matter of a second or two for one attachment to be removed and another substituted. The machine is as fool-proof as a machine could possibly be.

The machine will operate at three speeds, the change being effected by the flick of a button. The rotating motion of each attachment is a marvel of engineering skill, worked out with the utmost skill and accuracy, ensuring perfect balance. With the balloon

whisk for example, the whisk clips on with such ease that one would expect a "wobble," but instead, the whisk rotates and revolves with such degree of accuracy that it skims the bowl within a fraction, and covers almost every inch of area.

My questions, and the replies, were as follows:—

Q.—Whilst the body of the machine has a neat clean finish, will it not in time begin to show chips, and rust spots?

A.—The finish is of hard cellulose, whilst the metal forming the body of the machine is of Hyduminium alloy, so we have not only acquired lightness, but have also eliminated the possibility of corrosion. It is this latter element which is often the cause of paints and enamels being shed, with dire results to appearance.

Q.—As kitchen equipment is most often used by a non-mechanically minded kitchen staff, what precautions have been taken to ensure adequate oiling and greasing of the mechanical parts.

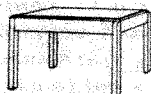
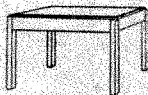
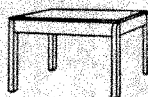
A.—The working parts are sealed and provided with a supply of oil sufficient to ensure perfect running for about five years, with the normal intermittent use for which the machine is designed.

Q.—Regarding the gears, is it not a fact that with many types of machines, the gears are stripped through switching over whilst the machine is running, and this being so, what steps have been taken to avoid this catastrophe.

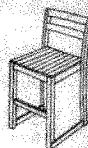
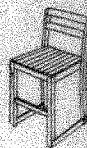
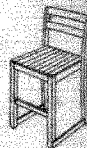
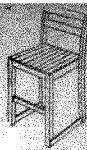
A.—The gears are in constant mesh, and cannot be damaged either by switching over, in a stationery position, or whilst the machine is running. Incidentally, the material from

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WHEN IS A CANTEEN A DANCE FLOOR?

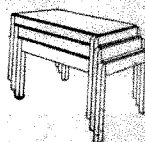


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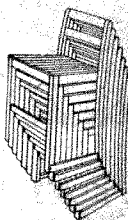


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steel, thus attaining silent and easy running. The main spindle is of special hardened and ground steel, mounted on ball bearings.

Q.—I once had a disaster with a new electric ice cream freezer. On the day after delivery, a member of the staff inserted the ice cream mix and set the mixer in motion. He was called away for a few minutes, and on his return smelt burning. It was found that the motor had burnt out due to overstrain. Apparently the mix had been left too long, and had frozen so stiff that the mixing arms could not move, in consequence of which the motor burnt out. Have you provided against such contingency.

A.—The drive from the electric motor is by means of a Vee belt, so that should undue strain be brought to bear, the belt would slip and prevent damage to the motor.

More Questions to the Maker

Q.—Is not the knife on the meat and bread slicing attachment rather small for normal requirements.

A.—You will note that unlike other slicing machines, the spindle does not project past the blade face, therefore the entire depth of the knife may be used, instead of only one half the diameter. You will also notice how carefully the blade is guarded to lessen the risk of cut fingers.

Q.—Do you consider that the 20 different tasks for which the machine may be used has fully covered the range of possibilities.

A.—By no means. Already in course of test are further attachments. Having designed a motive unit capable of adoption to practically any use, we shall add to the range from time to time, and owners of machines will be enabled to purchase the additional attachments at a comparatively low cost on account of our mass productive methods. The days of a separate machine for each job are ended. It is quite within the realms

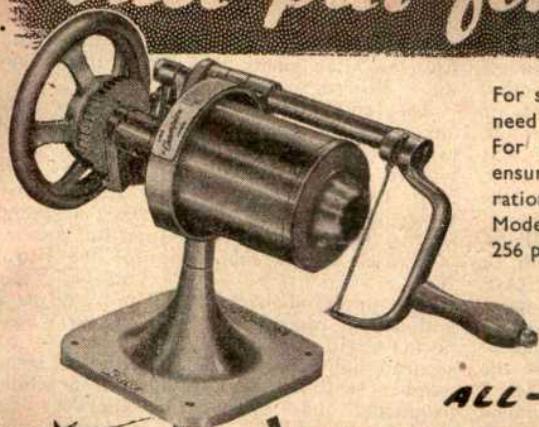
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of possibility that before the year is out, attachments will be available for washing dishes, and scouring pots and pans.

There was only one fault I could find with the appliance, and this is confined to one of the alternative methods of peeling potatoes. The container provided for the purpose of peeling potatoes, has a lining of perforated tinned steel. It may be that in the course of time, the tinning on this lining will wear off, and the metal commence to rust. I was assured that this would probably not occur, but I am still unconvinced. However, the point is a relatively minor one, for the replacement would only be a matter of shillings, and could be carried out by any tinsmith, or replaced by the manufacturers. In any case, one may choose the alternative potato peeling attachment, and in my opinion, this attachment will give 100% service, and be absolutely trouble free. With this type, the lining of perforated metal is not used. I would prefer to recommend this attachment rather than the other pattern.

The machine when used as a mixer, at least equals the best mixer on the market. It would be asking too much, however, to expect the appliance used in each one of its twenty duties to equal in merit a corresponding machine made solely for the purpose of carrying out one only of those duties.

Nevertheless, in many of the tasks, there is nothing better. It would require a book to adequately describe the machine—the care-

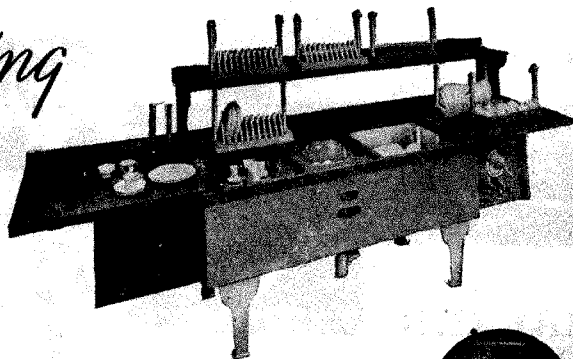
fully considered detail, the omission of awkward corners, dirt traps and angles; the hygienic finish of utensils and attachments; the total sealing and dust proofing of mechanical parts; the precision with which each part is made and the fact that after use, the attachments will "wash themselves up"! Nothing has been forgotten.

Apparently a service staff is ready to make any minor adjustment which may be needed at any time, so users should be free from trouble. Incidentally, the manufacturers have been the only company in the country throughout the war years, making a special type of Diesel Engine Fuel Injection Assemblies used in the submarines of the Royal Navy.

This universal machine will prove to be a godsend to caterers, especially those whose pockets will not permit the purchase of separate individual machines. Although large numbers will not be available for a while, production has commenced, and a few machines should be ready for despatch by the time this issue is printed. Production will gradually increase, until it is eventually possible to supply all comers. Arrangements for export are already in hand, and consignments booked. I am personally very pleased to find that, although America is usually first in the field with revolutionary equipment of this type, the old country appears to be a jump ahead in this instance, and to have devised a "world winner."

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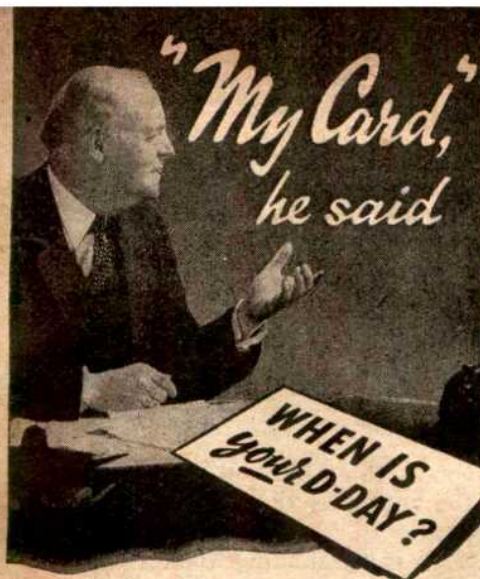
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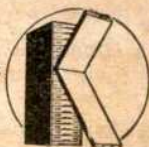
That fellow knew his job all right. He touched me on the raw, but he got me in the end because I knew quite well that he was right.

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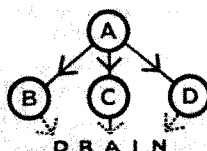
What is Thermal Linkage? It is more than a fuel saving device—it is today's technique in production efficiency and economy.

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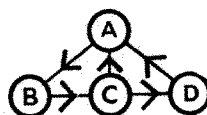
plant, to ensure that no heat escapes without first doing all the work it can.

It is a technique which can be applied in practically every heat-using establishment, large or small.

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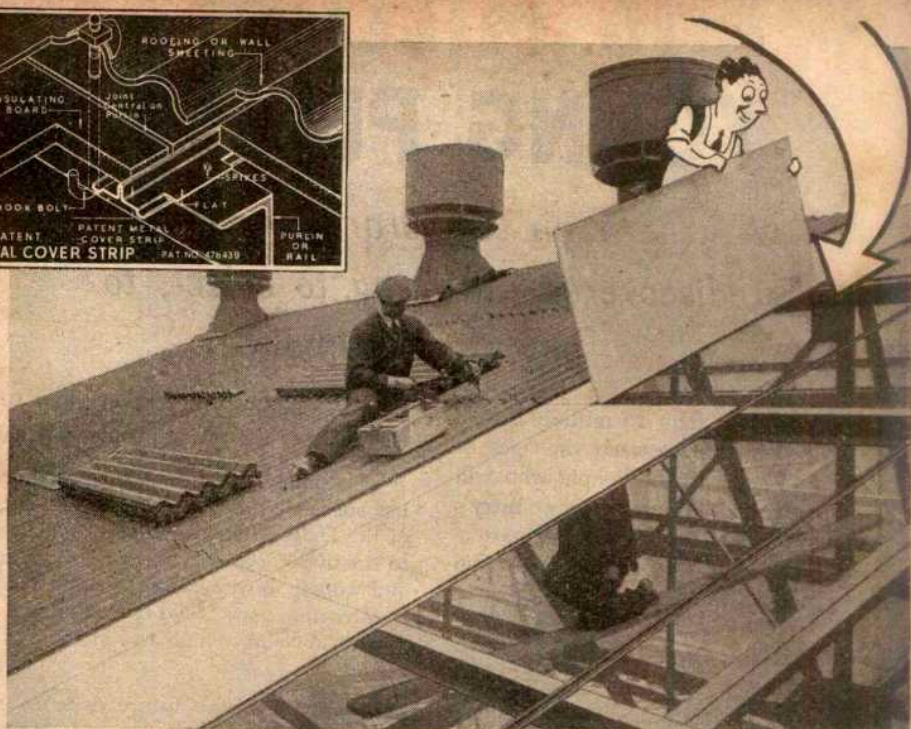
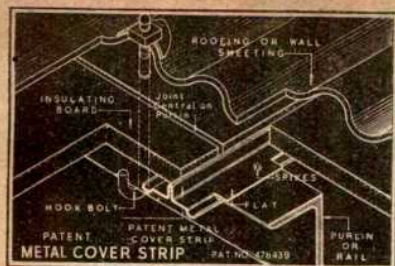
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ADDRESS

PHONE

Type of building

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16 MILLION YOUNG PEOPLE

*A generation temporarily lost—now
rediscovered—waiting to select, to
buy, to consume*

THERE are more than 16 million British men and women between the ages of 16 and 35. These are the people who will hold in their hands the bulk of the country's purchasing power during the coming quarter-century. With them lies the verdict on national policies: Through their choosing of consumer goods, their brand-preferences, manufacturers will rise to success or pay the cost of failure.

But this particular younger generation is in many ways unique. It has travelled more widely, suffered more deeply, assumed greater responsibilities age for age than any other. Yet, as a consumer group, it has reached maturity without the opportunity for forming buying habits. Nearly half of these men and women were in the schoolroom in 1939. Half of the remainder were but starting commercial life.

It is a generation temporarily lost, and now, of a sudden, rediscovered. It is the most important market that exists today. And it is waiting now to learn the good things of life, to select, to buy, to try—and to use for the next quarter-century.

How does this young group think? What are its interests? Where do its sympathies lie? In the pages of the Daily Mirror, day by day, you will find a great part of the answer. For it has been the policy of the Daily Mirror to

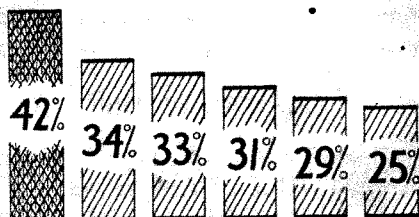
study and interpret, to stimulate and guide the viewpoint of the young people of Britain.

This policy, pursued consistently for years, has succeeded, beyond doubt. Today, 42% of the Daily Mirror's net sale of 2,400,000 is to the under 35's. Over a million young men and women buy it, read it, pass it round. It is *their* newspaper. No other national newspaper can claim so high a proportion of young readership.

Businesses whose future depends on the preferences of the coming generation must plan—as advertising space becomes more available—to speak to them more and more through their own paper, the Daily Mirror.

Proportion of Daily Mirror readers under 35 compared with other newspapers

DAILY MIRROR



THE DAILY MIRROR

Net sale in excess of 2,400,000—second largest in the world

"THAT'S OUR NEW BRANCH ON THE
CORNER ALL THE DESKS,
COUNTERS, GRILLES AND
OTHER FURNITURE ARE STEEL
BY **Sankey-Sheldon**
OF COURSE"



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Rapid Automatic Addition & Subtraction. Rests flat on the books. For Decimal or Ordinary Figures and Feet and Inches, etc.

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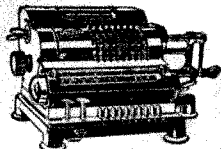


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Adds to £9,999 19s. 11½d. Price £6 6s.
 When ordering state for what purpose required. Also a cheaper pocket Adder for ordinary figures and Indian money, in case, 30/- post free.

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For all calculations. Multiply, divide, add and subtract in 1/10th time taken to do so mentally.

HIGHEST PRICES

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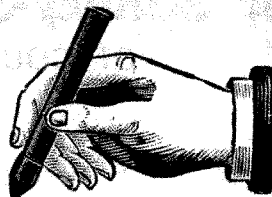
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Turn your
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EQUIPMENT
INTO CASH
 and help the
War Effort

THE ALL-RUBBER DAMPER

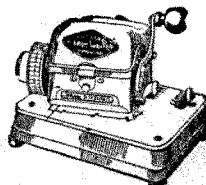
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FOR SALE
SAFES,
DESKS,
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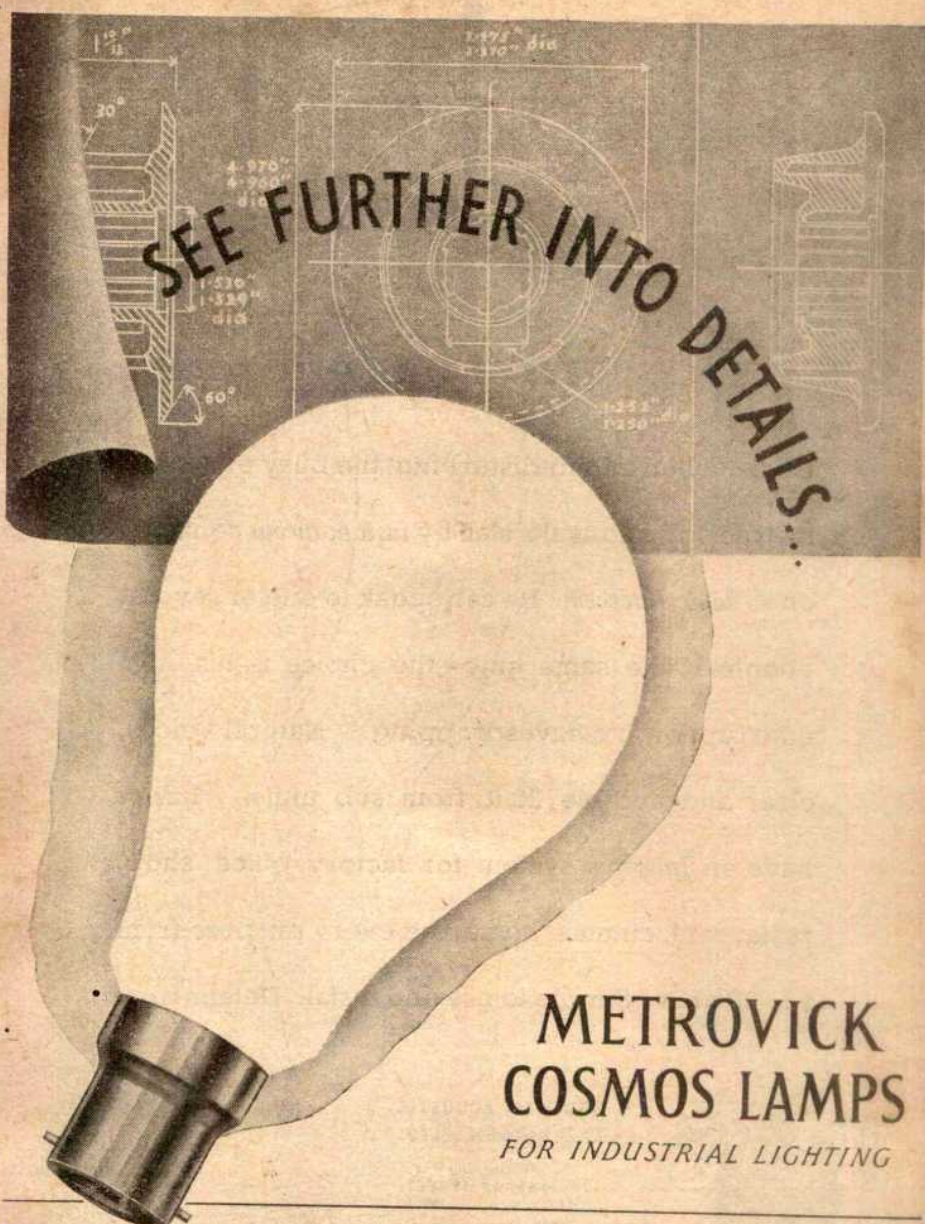
Used by leading Banks and firms. Do you realise that an altered cheque is your own liability? Price £12 12s.

All makes of Cheque Writers at bargain prices.

Phone: Holborn 3793, or write

TAYLORS TYPEWRITER MARKET

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SEE FURTHER INTO DETAILS...

The background features a technical drawing of a lamp with various dimensions: 1.5" dia, 30°, 4.975", 4.750", 5.30", 5.29" dia, 60°, 1.492", 1.470" dia, 1.222", and 1.250" dia. A large, stylized illustration of a light bulb is positioned in the center, with a detailed base shown at the bottom left.

**METROVICK
COSMOS LAMPS**
FOR INDUSTRIAL LIGHTING

METROPOLITAN-VICKERS ELECTRICAL CO. LTD
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THE INTERCOM "Plus"



LET ARDEnte HAVE A "VOICE" IN YOUR BUSINESS....



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Record sales don't just happen. They are the result of careful planning. But before you can plan you must have certain facts to guide you—facts about your customers and prospects, and about the enquiries, quotations, and orders you receive.

Sales Records on Kalamazoo VISIBLE, by keeping track of all these facts and presenting them in a significant form, give you that "over-all" picture of the market that is essential to every selling campaign. With all the facts at your finger tips, it is easy to profit from the past and plan for the future.

Kalamazoo

For Accounts and Records

There's a Branch near you — on the 'Phone

AN ANNOUNCEMENT OF Kalamazoo Ltd., NORTHFIELD, BIRMINGHAM 31

SIMPLIFIED TUBULAR CONSTRUCTION

by The **KEE-KLAMP SYSTEM** →

YOU CAN MAKE . . . HAND RAILS FOR BUILDINGS OF ALL DESCRIPTIONS • GUARD RAILS ROUND EVERY CONCEIVABLE OBJECT OR MACHINE • RACKS OF ALL KINDS INCLUDING TYRE RACKS • BENCHES • JIGS • TABLES FOR WELDING ASSEMBLY OR EQUIPMENT • TROLLEYS • INSPECTION AND REPAIR PLATFORMS • TOWERS • STAGING • HANGARS • SHEDS AND RUNWAYS, ETC. . . THE USES ARE ENDLESS.

No matter how complicated the structure may be, you can erect it by the **KEE-KLAMP SYSTEM**, which is Rigid yet Adaptable, Fixed yet Mobile, Simple yet Complex and Capable of Infinite Variation.

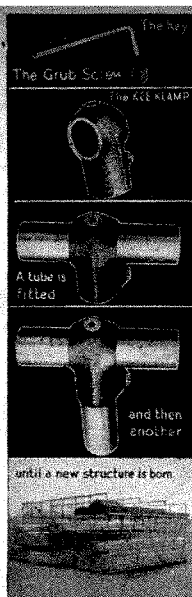
To solve constructional problems which in the past have involved the use of angle irons, plates, left and right hand threading and galvanizing after complete construction, we invite you to seek our aid. We believe we can find the correct answers.

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Phone: Reading 4831-2-3.

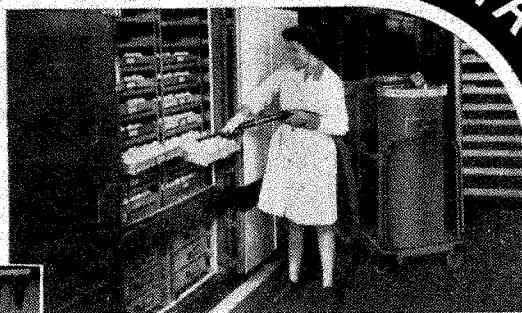


The hardened steel Locking Screws, when screwed through the Kee-Klamps, grip the tube, giving rigid construction. Structures can be dismantled swiftly and re-erected elsewhere.

ESSENTIAL HYGIENIC

B.V.C

INDUSTRIAL Portable VACUUM CLEANERS



STANDARDS

With acknowledgment to Sparks Poultry Industries

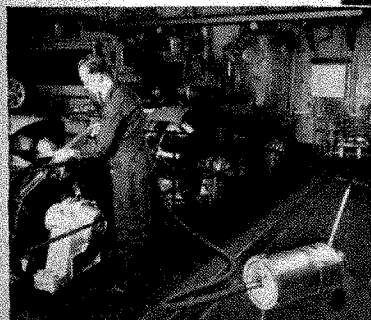
● The maintenance of superior hygienic standards is recognised today as being just as essential today on the poultry farm as in an engineering plant. These are just two of the widely differing industries in which B.V.C. Industrial Portable Vacuum Cleaners are effectively used to accomplish different ends.

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Royal London House, 196, Deansgate, 3
Telephone: DEANSGATE 5159 SALE 2298
Telegrams: "DEANSGATE 5159"

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14, Westgate Street
Telephone: Cardiff 2201
Telegrams: "CARDIFF 2201"

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Jayson's Buildings, 47, Pink Lane
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Denman House,
24, London Bridge Street, S.E.1
Telephone: HOP 1642
Telegrams: "PYRANT BOROH"

NOTTINGHAM

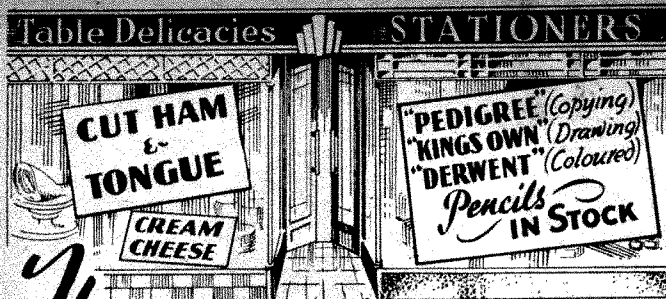
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Telegrams: "NOTTINGHAM 43282"

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STANDARD V-BELTS • SHO V-BELTS • SPECIAL V-BELTS

J. H. FENNER & CO. LTD.

V-Belt Sales Division

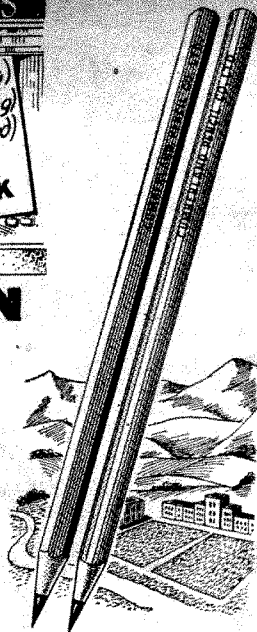
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These **WILL RETURN**

The period of patient waiting is shortening as the days go by. Gradually the normal ways of life will return.

Until then, the Nation courageously "makes do" with austerity articles — many of them very good indeed, e.g., Genuine "CUMBERLAND" Utility Copying and Drawing Pencils. Truly worthy deputies for CUMBERLAND'S more specialised grades.



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SALES AND ENQUIRIES: BRITISH PENS LTD. BEARWOOD RD., BIRMINGHAM

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They will be pleased to assist, so help the Railways to help you by keeping close contact with your local —

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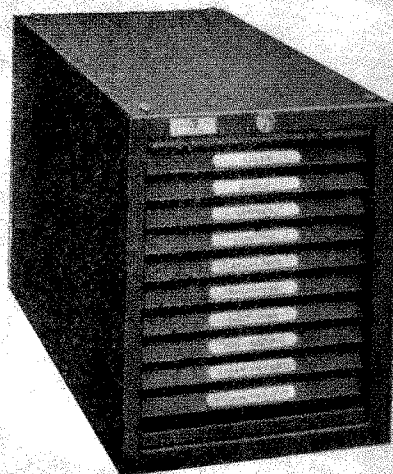
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- Each pocket revolves on a wooden hinged rod with brass ferrules giving accurate spacing and visibility.



Reg'd Office & Works STROUD, GLOS

JUNE, 1946



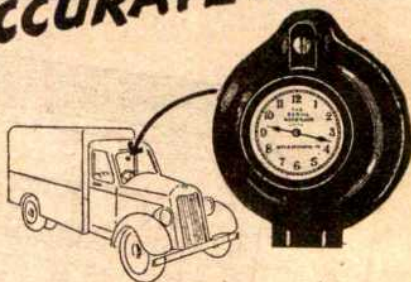
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**UTILICON
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MILTON OF CAMPSIE near GLASGOW

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ACCURATELY!**



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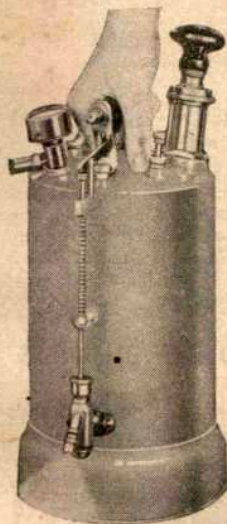
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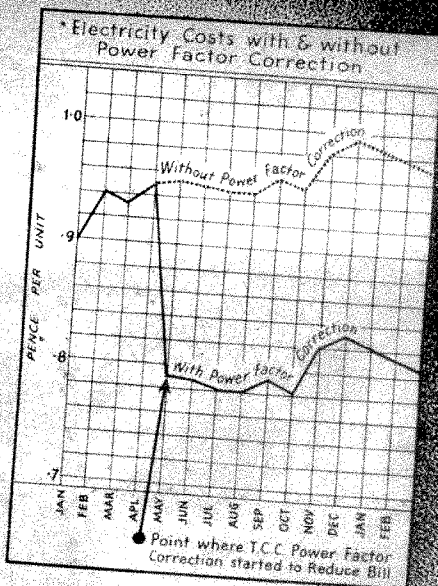
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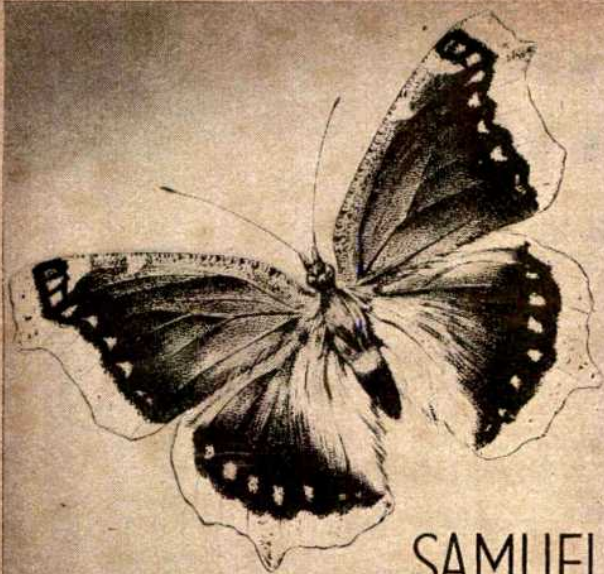
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THE 'EYES' HAVE IT FIRST—
AND THE FINGER-TIPS A SECOND LATER

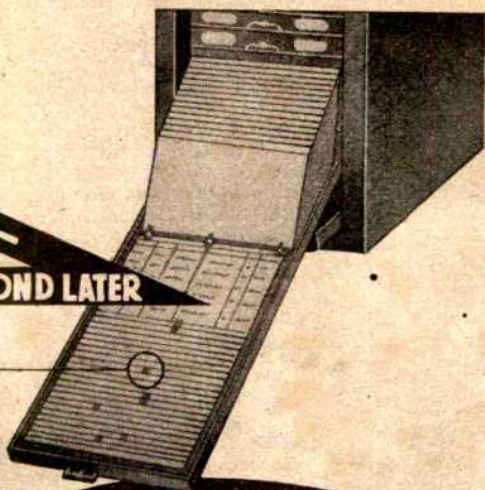
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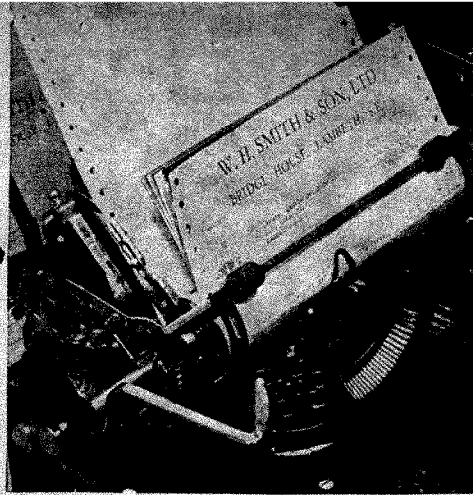
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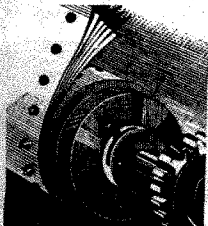
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Formcraft is a special technique, developed by Alacra Business Systems to satisfy present day requirements for effective and easy control.

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W. H. SMITH & SON LTD.

BUSINESS FORMS DEPARTMENT,
BRIDGE HOUSE, LAMBETH, LONDON, S.E. 1.

Telephone: HOLborn 4343.

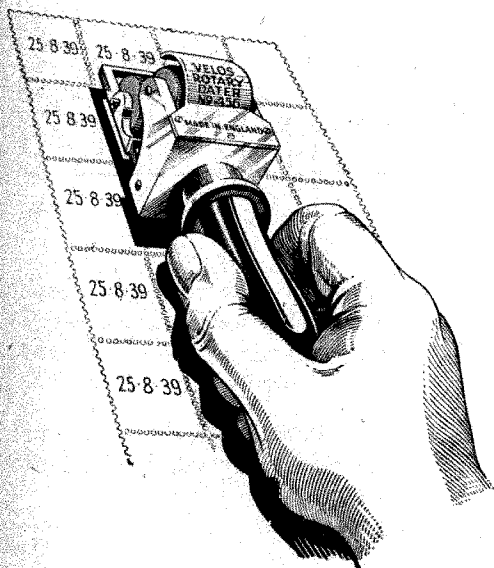
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JUNE, 1946

19

time saved
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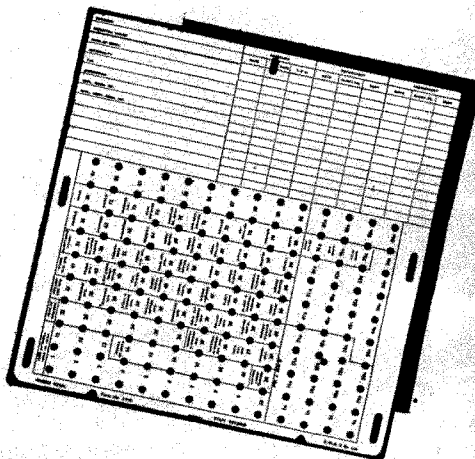
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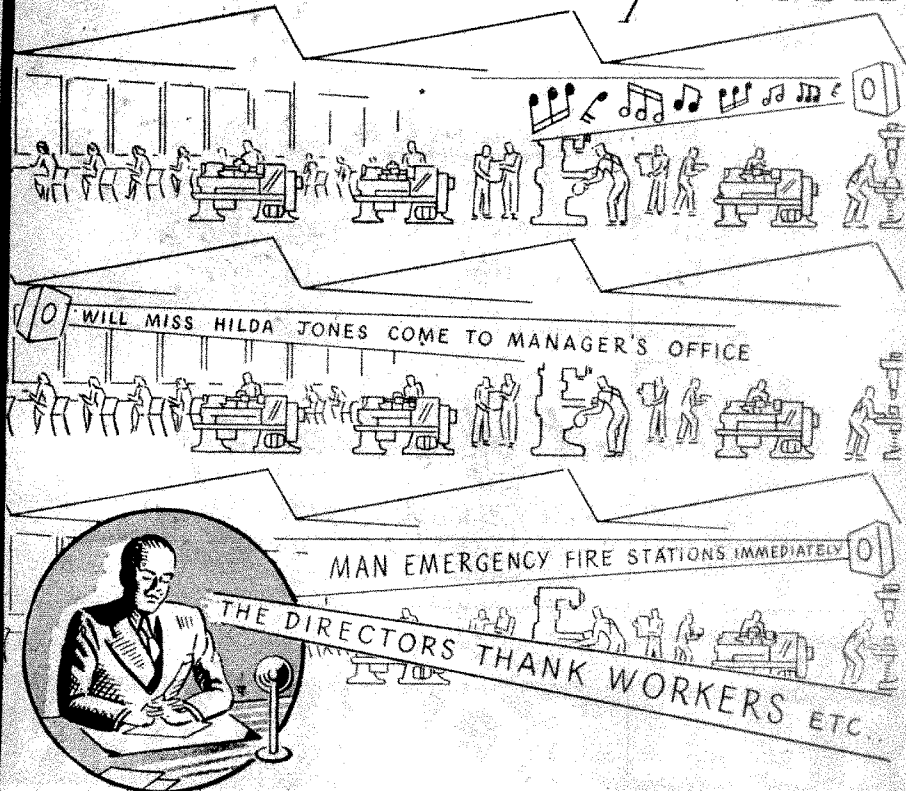
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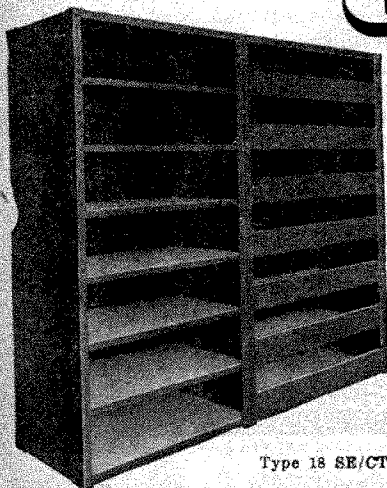
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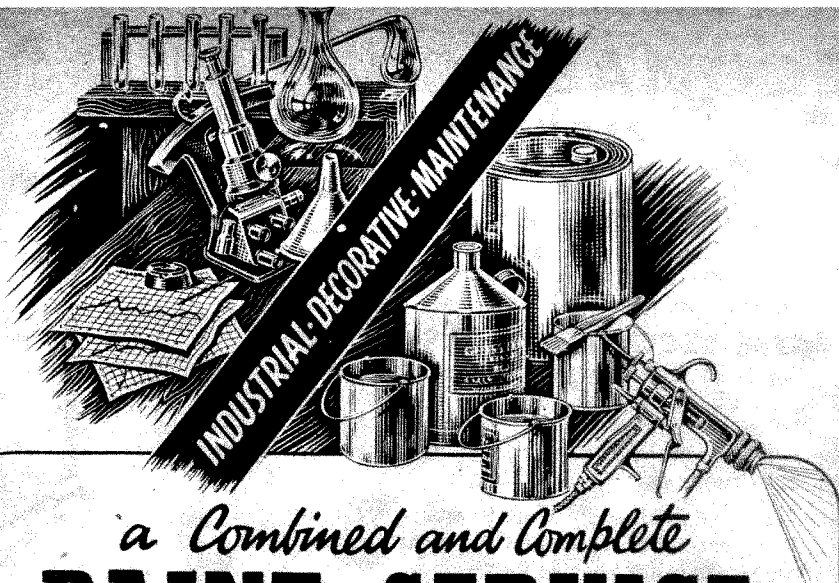
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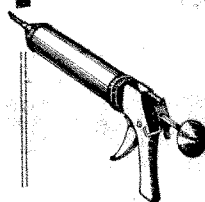
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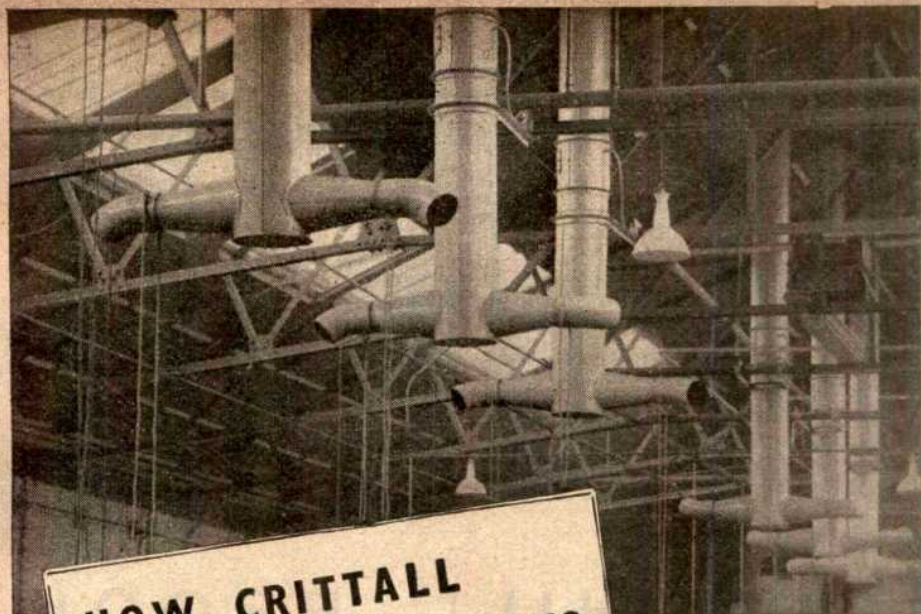


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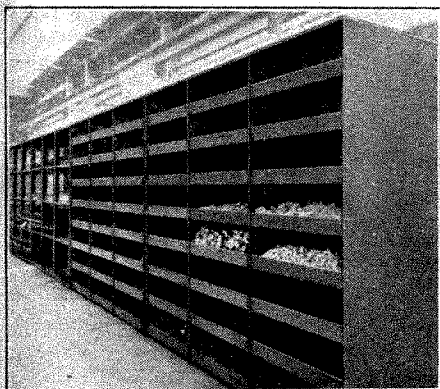


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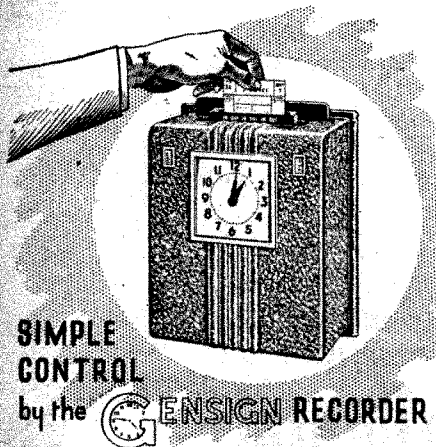
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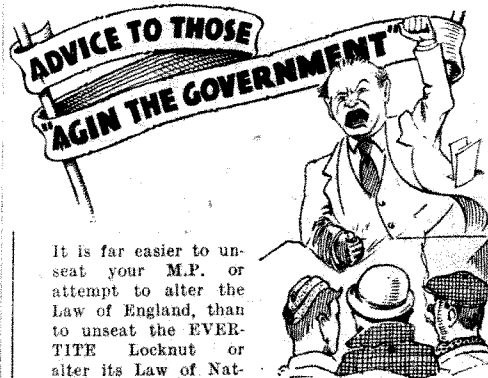
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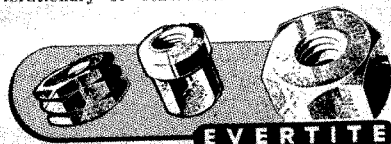
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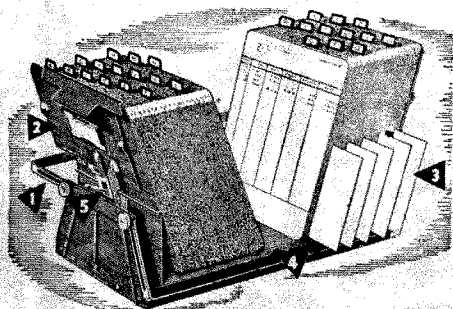
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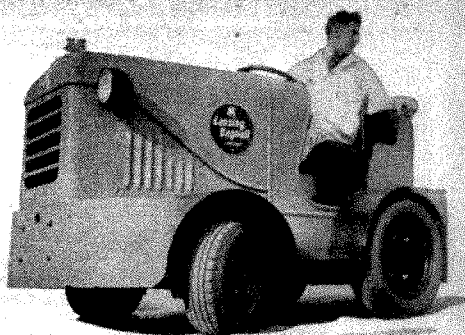
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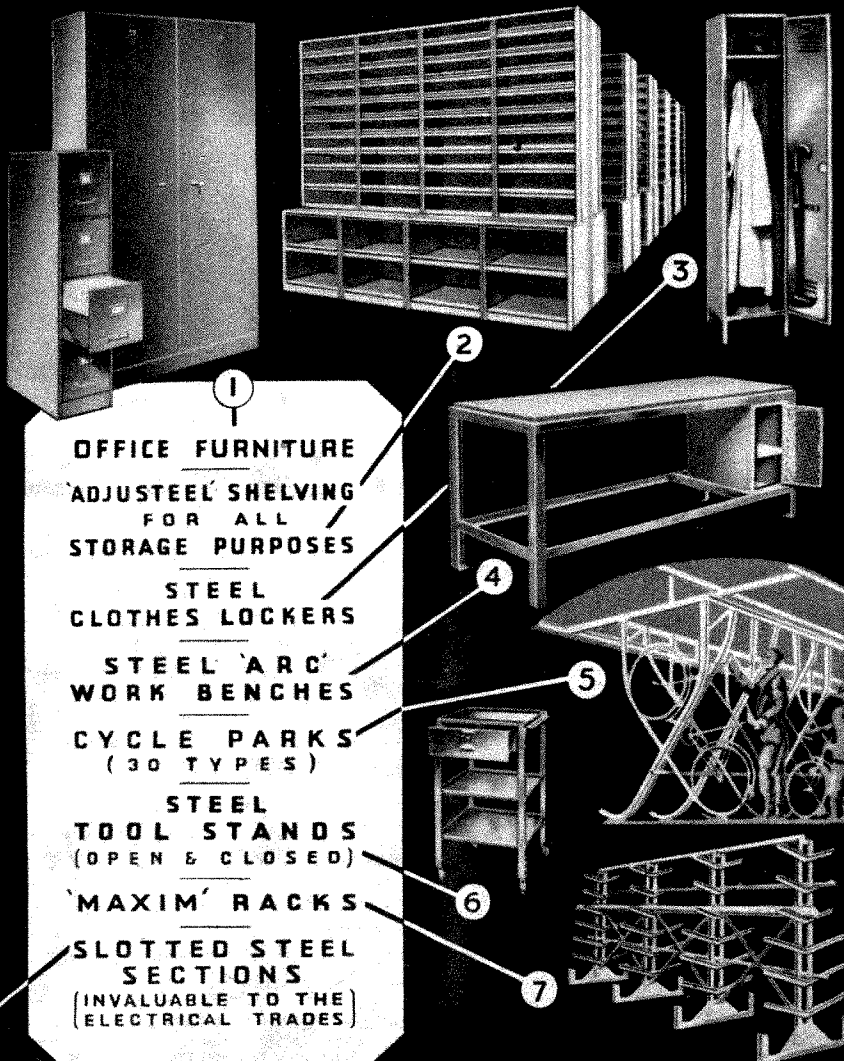
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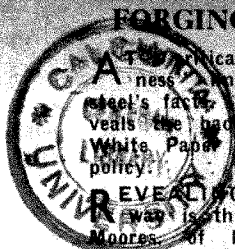
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1946

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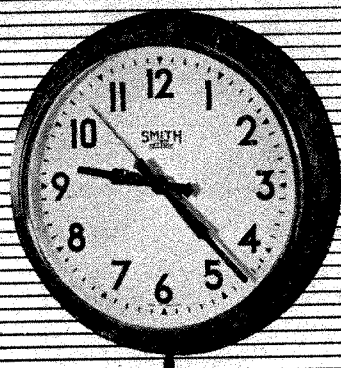
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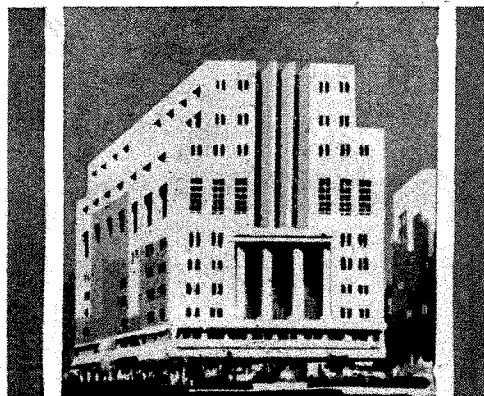
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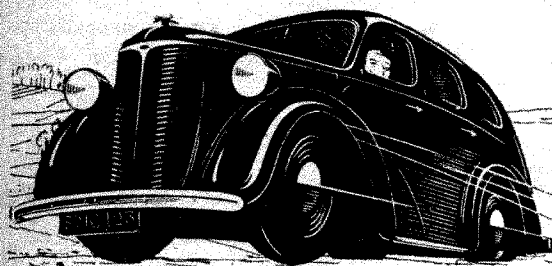
Anglia (8 h.p.) are thus more than ever the "order of the day".

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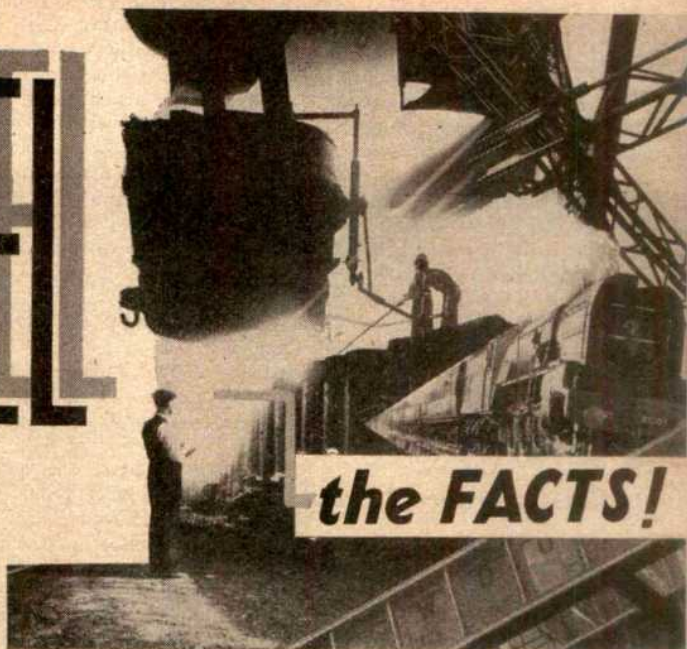
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STEEL



the FACTS!

For Those to Whom STEEL is a Raw Material What Really Matters is Efficiency, Price and Output

By HENRY OWEN

THE iron and steel industry is the basic industry of modern industrial society. Its very size is impressive enough; it employs some 200,000 workers, represents some £150,000,000 capital and is one of our leading export trades. As a producer of goods for consumption—alarm clocks, bath taps, houses, furniture, tins for food, cars—it impinges on our daily life in a hundred different ways.

But its importance does not primarily rest on either of these two factors; what gives steel its crucial significance is its use as a raw material for producing the capital goods which are used in every other industry and without which they in turn could not produce.

Steel is the essential raw material for the construction of factories, offices, tools, railways, ships, aircraft, agricultural machinery, is, in short, the material out of which the nation's capital is created. Its efficiency as an industry is therefore a matter of vital concern to the entire business community.

An ample supply of cheap steel is a con-

dition precedent to a rise in the standard of living at home and to the development of a flourishing export trade, is, indeed, essential if Britain is to retain its place as a first-rank industrial power.

The efficiency of the iron and steel industry, as of any other industry, is a compound of three factors: its costs, its price policy and its production policy. These three factors will be examined in turn.

In general, costs are unduly high owing to obsolete plant and methods.

The first process in the industry is the transforming of coal into coke for use in the iron-extracting blast furnaces. In boom conditions the supply of this coke is found to be insufficient to meet the needs of the blast furnaces in the next production stage; as a result, coke prices between 1933 and December, 1937 rose two and a half times as fast as the price of the coking coal from which it was made.

There are too few coking ovens and each

oven and battery of ovens is too small. A large number date back to the 1000-14 era. A battery of 100,000 tons is regarded as large here as against the "normal" batteries of 500,000 tons of America and pre-war Germany. There is inadequate use of the immensely valuable gases given off in the coking process; failure to put these gases to proper use makes a difference of some 5s. a ton to the cost of pig iron. Yet in 1930, nearly one-half of the total capacity of by-product ovens consisted of waste-heat installations where the surplus gas given off was only one-fifth of that given off by the regenerative type.

Finally, the coke ovens are, in the main, badly located. They tend to be run in conjunction with the pithead, whereas huge economies can be secured by running them in integration with blast furnaces and steelworks whereby the blast furnace gas can be used to heat the coke ovens and the coke oven gas can be used in the steel furnace.

Blast Furnace Layout

The position is no better at the blast furnace stage where the iron is extracted from its ore. Blast furnace efficiency is a function of size and to secure full economy no furnace should have a capacity of less than 100,000 tons per annum. Yet in 1937, the average production of furnaces in blast was.

	Tons		Tons
Britain:	68,000	Germany:	127,700
Belgium:	81,060	U.S.A.:	254,400
Luxemburg:	90,300		

By January, 1946, Britain's rate had increased to 74,620 tons per annum.

By expanding the size of their furnaces and reaping the economies that go with such expansion, America was able to reduce its labour cost per ton of pig iron between 1919 and 1930 from 3s. 1d. to 1s. 8d., despite a substantial increase in wages over the period. The following index figures show output per head in blast furnaces in 1936: Britain, 100; Germany, 115; U.S.A., 361.

Moving down to the next process—the steelworks which transform the iron into steel—the first feature to be noted is the relative absence of the integrated plant, the plant in which the coking ovens, blast furnaces and steelworks are run in physical co-ordination. Every industrialist knows of Corby, Ebbw Vale and Shotton; but for them and their costs these are unfortunately the exceptions. Such integration, in finding good use for the coking oven and blast furnace gases, and in obviating re-heating at each successive stage, leads to the most sensational fuel economies.

The fact that by 1927 America had got

its coal consumption per ton of steel down to 28 cwt whereas in 1944 Sir William Larke was still talking in terms of two tons being needed, speaks volumes.

Integration also leads to great economies in transport costs. Before the War as much as one-third of the pig iron produced was not worked up at the furnace works but was sent elsewhere. In 1935, 2,864,000 tons of pig iron was handled by the railways at a freight cost of £666,378, adding 6s. 2½d. a ton to the cost at the foundries or steelworks. Exactly the same economies result from integrating the finishing processes with the steel furnaces.

Study in Comparative P.M.H.

The second feature of the steel-making process is that the furnaces themselves are too small. Here again, efficiency is largely a function of size.

In 1938, one quarter of the open-hearth furnaces (113 out of 446) were of under 50 tons capacity, half between 50 and 80 tons (226 out of 446) and only 51 of over 100 tons. In addition, there is far too little attention paid, in the average steel works, to lay-out, compactness and general tidiness and arrangement, in short, to good housekeeping.

The years of depression after the last war, denuded the industry of the efficient go-ahead managing class which it, and the nation, urgently requires. To sum up, the following index figures show the physical output per head in 1936:

	Britain	Germany	U.S.A.
Iron and Steel (smelting and rolling) ...	100	114	168
Iron & Steel Foundries	100	120	186

The above picture of the industry deals only with the costs factors within its immediate control, but there are very important factors in steel costs which are less capable of adjustment within the industry.

There is, for example, the price and supply of coal. As to this, the iron and steel industry must accept some share of the responsibility for the present coal crisis. The financial interconnections between it and the coal industry are very close.

In 1935, the Census of Production showed that 84 per cent. of all blast furnace workers were employed by 22 concerns which also owned collieries employing 13 per cent. of all coal miners. Fifty-one per cent. of all smelting and rolling workers were employed by 21 concerns (largely over-lapping the above) owning collieries employing 12 per cent. of all miners. Clearly the industry is entitled to assurances from the nationalised coal industry that coal prices should be reduced and

a good supply of this vital raw material be guaranteed.

As has been indicated, the industry itself can do much by putting its own house in order to reduce the heavy transport charges, today amounting to 1/5th the cost of finished steel. Even if every possible economy were effected, however, transport costs will inevitably remain a heavy charge for the simple geographical reason that the coal, ore, centres of production, and markets, are not all found in one place and transport is necessary to bring them together.

The industry is entitled to demand of the transport industry that its freight costs be kept as low as possible and its service—particularly the canal service, which if properly developed, is invaluable for haulage of heavy, non-perishable goods—be efficient.

The same demands can properly be made of the electricity supply industry. The cost of electricity is of crucial importance in the use of electric furnaces which have very many technical advantages.

The present technical condition of the industry is one of remarkable unevenness. There are some highly efficient plants and

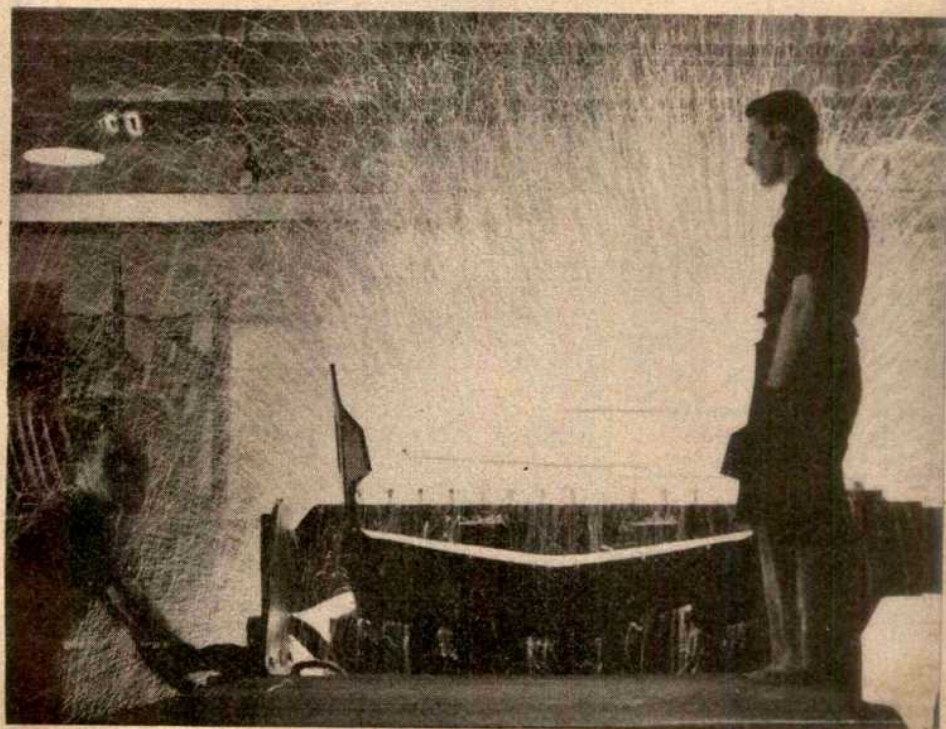
many of most shocking inefficiency. There is far too much out-of-date and antiquated plant that ought to have been scrapped long since and there is much more plant that is badly placed vis-a-vis the production stages immediately before and after it, so that, although technically efficient in itself it becomes economically inefficient when viewed as part of the production process as a whole.

Large scale modernisation of plant is an urgent necessity but with this will have to come a complete overhaul of the whole lay-out of the industry.

Any plan for the industry must be judged by the extent to which it plans for the industry as a whole, balancing and integrating and inter-relating the various processes of production, and not merely by the extent to which it provides for new plant to be laid down.

Unless such a plan is adopted costs will continue to remain unduly high; technical efficiency in particular plants which is not coupled with a good lay-out for the whole industry will not result in economic efficiency.

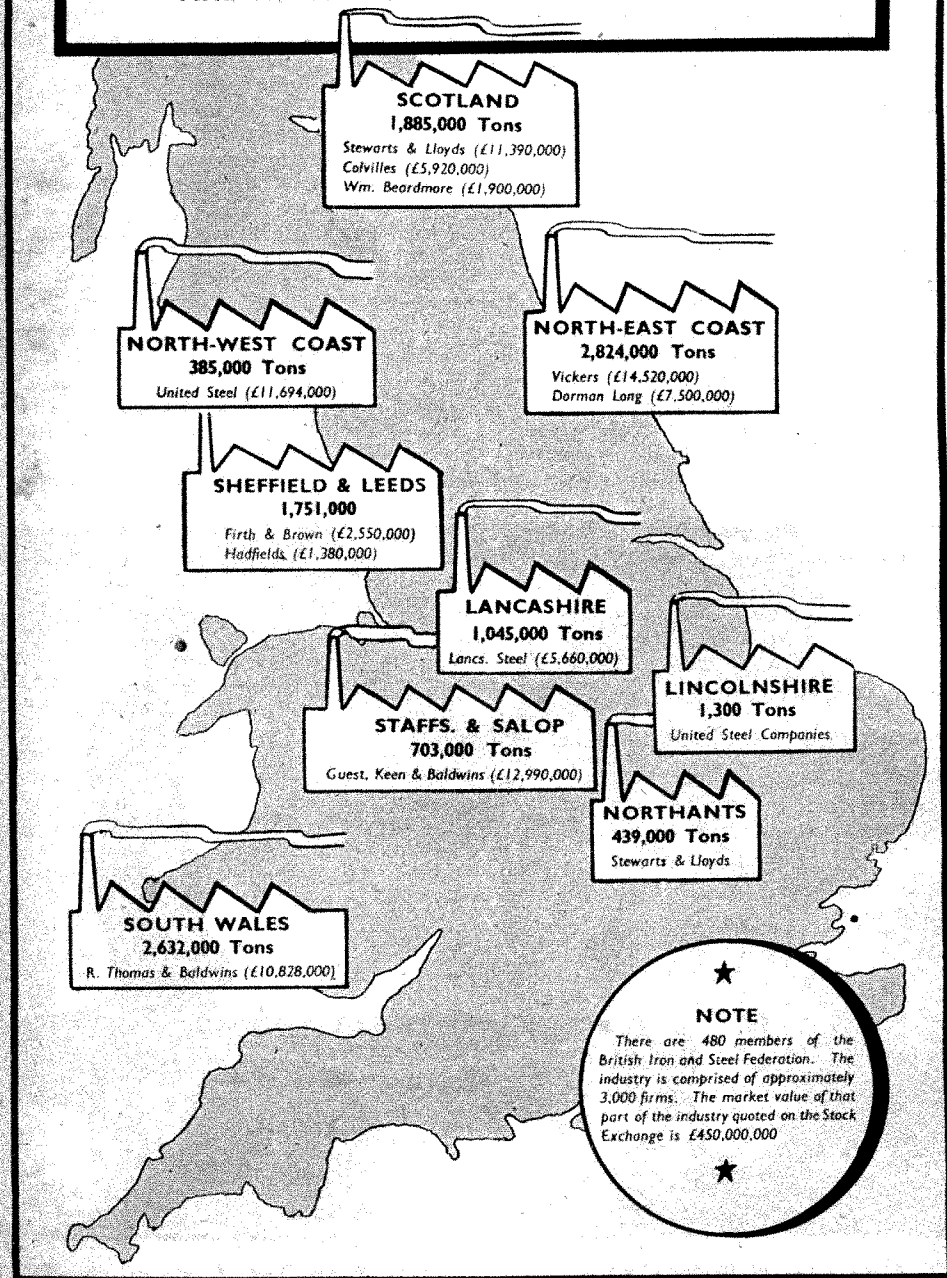
In passing it is necessary to say a word about the wages structure of the industry.



Into the maws of Britain's Motor Industry go tons of steel bars, ingots and sheets.
• In the plant above, where Army trucks were made, output reached a wartime figure 100 times greater than 1939

THE BRITISH IRON and STEEL INDUSTRY

SOME OF THE GIANTS (SHOWING ISSUED CAPITAL)
AND ANNUAL PRODUCTION BY REGIONS



North, South, East and West are spread the roots and the branches of the steel industry.
To integrate so vast an enterprise might well turn out to be an impossible task

It is impossible to give a brief description of the basis of wage payments because, except for the smelters, there is no national agreement covering any section of the industry. Apart from them, wages are agreed either on a district basis or, more usually, are arrived at as a result of negotiations in each particular firm, with the result that there are variations in the actual rates for one job as between one firm and the next and also in the very principles used as a basis for wage agreements.

Until 1940, when as a war-time measure wages became temporarily based on the Cost of Living Index, wages in the majority of cases were on a sliding scale rising or falling with the selling price of steel; the higher steel prices rose, the higher were the wages and contrarily. It is surely unnecessary to point out how unsatisfactory such a principle of wage ascertainment is. There is no efficiency incentive held out to the workers, indeed the opposite, as the workers are given a vested interest in high steel prices.

One of the surprises of the industry is the fact that the leading trade union, the British Iron and Steel Trades Confederation, has consistently shown itself in favour of rationalisation and modernisation, has put the long-run interests of the industry and, hence, of its members before their apparent short-run interests; a truly impressive piece of industrial statesmanship. But clearly no union ought to find itself in such a dilemma; one of the more important reforms which is necessary is the substitution of a nationally-negotiated set of wage rates based on intelligent principles.

And then the Wages Problem

At the same time the employers would do well to learn something about the economies of high wages. In 1938 the average wage paid to iron and steel workers was £3 10s. per week—half that of America. In an industry where there tends to be periodic spells of prolonged unemployment and where skilled craftsmanship of the very highest order is required, surely these wages are uneconomically low. If the industry is to follow an expansionist policy in the future, it will find that such wages simply will not pay.

Leaving the costs side of the question and turning to the industry's price and production policies, these are found to be determined by the British Iron and Steel Federation.

This body came into being in 1934* with very wide objects. It is empowered to do anything it can to assist its members or the industry, to promote efficiency and to encour-

age exports. It is a federation of the federations representing the various sections of the industry. In 1939 two sections of the industry were not affiliated, but it is now believed that the entire industry is associated with it. Its chairman throughout has been Sir Andrew Duncan. The Council of the Federation has as members, representatives of the leading concerns in the industry.

In effect, the Federation forms a cartel for the industry, controlling the price, export and production policy of iron and steel; it fixes prices for the industry on the basis of costs of production plus a reasonable margin of profit. It arrives at the cost of production of a particular product by taking an accountant's valuation of the actual cost of producing it in a "representative" firm and adds to it a percentage of the "capital employed" as profit.

How Prices are Assessed

This was the basis of price assessment from 1934 to 1939 and was the basis of the control price since 1939, though during the war, higher prices were actually paid to the high-cost producers, these higher prices being either met by levies on the more efficient producers or by indirect Government subsidy.

Leaving aside the extraordinarily complicated system of varying price fixation during the war and confining ourselves to the assessment of the basic prices as fixed from 1934 to date, the position is by no means satisfactory. In an industry of its basic importance where "the steel industry would make no attempt to deny that in prices, as in other matters, the trade acts in combination" (Sir William Larke, director of the Federation in the "Financial News," 6/10/44), it is vital not only that no "monopoly squeeze" should be exerted but that it should manifestly be seen not to have been exerted.

A consumer of steel will note that prices are fixed by the industry "in combination" and that these prices have risen, according to the Board of Trade wholesale price index, by 108 per cent., i.e., more than doubled, since 1934. He will be told that this price increase is justified by increases in costs and, of course, costs have increased.

But he will not be satisfied that the fixed price is the right one—allowing only a reasonable margin of profit and giving a real incentive to maximum efficiency—unless he knows exactly how this price is arrived at.

The truth is that although he is told the general method of price assessment, he is not told any of the vital details which would satisfy him, as a business man, as to the rightness of the price.



After "tapping" a Siemens open-hearth furnace, steel men fill the mould with the molten metal

The Federation have given no account as to how they pick the firm which is to be treated as "representative." Clearly this is crucial; if the firm chosen is towards the high-cost end of the scale the costs on which the price is based will be higher than if a low-cost firm is picked as representative.

It is silent too as to the costing principles employed in arriving at the "costs" figure. This is an easy matter when a firm is producing only one type of product. But where a number of products are being turned out, much depends on the accountant as to how the costing is done, and the accountant is appointed by the Federation. "Profits are a roughish thing," wrote the *Economist* once, "They are as long as an accountant's foot," or, it might have been added, as deep as an industrial consumer's pocket.

There is too great a silence on the percentage of profit allowed. It is only thanks to the Vote of Credit Appropriation Account, 1941, that we are given any idea of what the profit margins were. In 1936-7, the margin in heavy steel was 10.5 per cent. and for the

whole industry, 12 per cent.; during the war, the percentages were about 9.5 and 11.5 respectively. The Auditor General commented that these were above the rate allowed under the Ministry's costing contracts for other industries.

In view of this lack of information it is not surprising that there should be a considerable variation in public reaction to the prices fixed. The Import Duties Advisory Committee—the father of the Federation and the sponsor of its activities—wrote, in 1937, that the industry believed in a "moderate and stable price policy; a policy of low prices." Lord Nuffield—a consumer and industrialist—on the other hand, was unkind enough (on August 22nd, 1937) to describe the whole thing as a "perfect ramp, an absolute ramp. Big cigars and nothing to do."

The fairest summary of this dispute is to say that where a Federation of the leading firms in a vital industry choose to fix prices in a monopolistic manner without supplying any of the necessary data to enable the consumers or the general public to assess the fairness of the prices charged, and where those prices are more than doubled during the twelve years in which this practice subsists, it is not surprising that voices of protest are raised.

Steel's Export Policy

The Federation's export policy, 1934-9, was one of stability. In 1935 it virtually joined the European Steel Cartel and linked Britain's exports to the price and quota scheme of that body. With the collapse of the E.S.C., the Federation is left free to find its exports where it wishes.

To sum up the industry's condition to-day; from the technical point of view, the costs side, there is tremendous leeway to be made up, not only as regards modernisation of plant but particularly as to the general layout of the industry as a national productive unit; as far as prices are concerned, the data is insufficient to produce a dogmatic opinion, but there is considerable reason to believe that the admitted monopoly is taking undue advantage of its position; as far as production policy is concerned, this has been one of maintaining the *status quo* and refusing to expand the capacity of the industry.

This is the background to the Federation's Plan for the industry which was published as a White Paper on May 8th, 1946. This plan proposes new capital expenditure of £168,000,000 over the next five to seven years. It lays particular emphasis on increasing the size of the finishing processes and although it plans for a considerable degree of modernisation of coking ovens and blast furnaces,

it does not set out to remedy the lack of balance between processes to which attention has been drawn. It plans to get the extra pig iron and semi-finished steel which is needed by imports, as it did before the war.

The Plan provides for an increase in steel capacity to 16 million tons, 3 millions for export, 13 million tons for home consumption. This is an increase of 12½ per cent. over the present figure.

As to export, the average annual figure between 1920 and 1938 was 3 million tons. In 1929, iron and steel exports totalled 4,380,000 tons. The national need for expanding exports is well recognised. Europe will be an active market for years: Germany is out of the running, the Steel Cartel is dead. Britain has a great opportunity to get into the Continental market and consolidate its position before local competition becomes active. In addition, there is the potential Russian market for machinery—subject to credit adjustment—and the Empire.

Pegging its exports to two-thirds of the 1929 level, is surely not the way to tackle the market. By limiting supplies for home use to a 12 per cent. increase over the 1937 home consumption of 11,600,000 tons of steel, the Plan shows again very limited vision. The demands of reconstruction, of housing,

of the new transport scheme, surely call for larger steel capacity than that contemplated. It would seem that the Federation is adhering to its past policy of drastically limiting capacity.

The Plan is silent on price policy. It deals exclusively with costs. It makes no proposals as to how far the present price-fixing structure is to be modified or to the extent to which reductions in costs will be passed on to the consumer by way of lower prices.

On the question of the financing of the Plan, the Federation is a little vague. They state that the industry can only find one-half the money required and hint—but do not openly state—that the Government should find the rest.

The issues involved are plain enough. The choice which must be made is between the present cartel, probably largely financed with public money, and nationalisation. Readers of *BUSINESS* will probably not be very impressed by the violent arguments which are being advanced, based on conflicting political ideologies. The decision as to which of the two alternatives should be based purely on the practical consideration as to which is the more likely to lead to the production of an ample supply of cheap steel which the nation so urgently needs.



For armament every scrap of steel was needed. Above—He-men's work—A steel man boring holes into giant ingots with oxy-acetylene cutter, prior to blasting with gellignite

Littlewoods Set - Up



On floors which weekly revealed a peace-time fortune—Littlewoods turn out the familiar Barrage Balloons

IF you start life as an ordinary Lancashire lad and in a matter of fifteen years build up three separate businesses that employ 16,000 people, have an annual turnover of many millions of pounds, and in a real sense are household words, the world wants to know just how you did it.

Mr. John Moores, Chairman and Managing Director of Littlewoods, is the Lancashire lad who has achieved this, and to him the secret is plain.

It is all a matter of figures and system. You work everything out on paper, from the broadest outline of your boldest venture to the last detail of day-to-day routine before you buy so much as a brick of your building or engage a single employee to help you do the job. You get your whole project scheduled complete down to costs, personnel, intake and output of work. You analyse the exact items and processes involved, and the way they must be broken down to co-ordinate them and achieve continuous activity. You calculate the precise time each one of them will take each employee and the particular fraction of overheads to be allowed for it.

Then, in one giant gesture, you transfer the whole thing from paper to reality at the appropriate moment. Pallas Athene springs in full panoply from the head of Jupiter. And she probably arrives equipped with electric typewriters, adding machines, card indices and continuous notepaper. She moves to a smooth, unvarying rhythm induced by Jupiter's knowledge of and reliance upon Time Study, and her life is regulated by a mechanised punch-card system.

That is what happened in February, 1924, when John Moores, a busy, hard-working

And JOHN MOORES Sets the Pace

Manchester man, who had risen to a quite responsible position with one of the well-known cable firms but had done nothing to distinguish him from millions of other ordinary men all over the country and the world, started the first public football pools in this country.

He planned the venture and tried it out with a colleague in the cable business and some members of his own family. Then, striking ahead on his own, he established a business which within a few years reached nearly one family in three throughout Britain, and gave employment to 12,000 people.

He enjoyed the fight that venture involved—but when he had won it he wanted to do something else. So in January, 1932, he set up a mail order business which soon had a turnover of £5,000,000 a year.

Then in January, 1937, he established the first of the chain stores, which by 1939 numbered 26 and but for the war would have increased to over 50 in that year.

A Novel Switchover

On the outbreak of war he was able to switch his entire pools and direct mail organisation, almost as it stood, to a vast programme of war work.

In 1939 Littlewoods placed the buildings and factories which had been the home of pools, mail order business and chain store administration at the service of the nation.

In 1939 one building was given over to the censorship, and by the end of 1944 over 16 factories, laid out and equipped in the most up-to-date style, were engaged at full pressure on war work and employing over 14,000 people.

They produced 12 million shells, 6 million fuses, 5½ million parachutes, 750 Wellington frames, 50,000 dinghies, 20,000 balloons, 4,500 pontoons and storm boats, and they boxed 25,000 vehicles.

This, in John Moores' view, proved that "previous experience in any task is far from being the first essential. If real organising ability is there, if keenness, sound judgment, initiative and drive are possessed by the executive staff, if the workpeople are united by esprit-de-corps and pride of corporate achievement . . . then there is practically no limit to what can be achieved."

In other words, if you plan your business on a proper system you can achieve a rapid

Runs True to Form

An Interview With ELIZABETH EWING

and complete switchover from one kind of work to another. Technical instruction can be given quickly and easily. Littlewoods mail order girls, for instance, became skilled technicians and carried out delicate engineering processes in the minimum of time.

John Moores talks easily, quietly, and very rapidly, with a Lancashire accent as broad as it ever was. He likes talking of his system and his organisation, but is anxious only that you should understand it and approve of it.

It is a shock when you learn that he is fifty . . . and you notice the wiry hair is greying. And another shock when, leaving after nearly two hours that have passed like ten minutes, you find the ante-room crowded with big business men all waiting for another conference with the slight man who is chief of them all, and whose very office name "Mr. John" has an air of youth about it.

The Managing Method

Those conferences are an important part of John Moores' life. Since a business must run tidily and systematically he has, for each of his three main interests, a management committee comprising executives belonging to the concern involved—the general manager, sales manager and accountant.

These, along with himself, his brother and co-Director Cecil Moores, his chief executive Mr. E. A. Sawyer and his chief accountant, control the particular section involved.

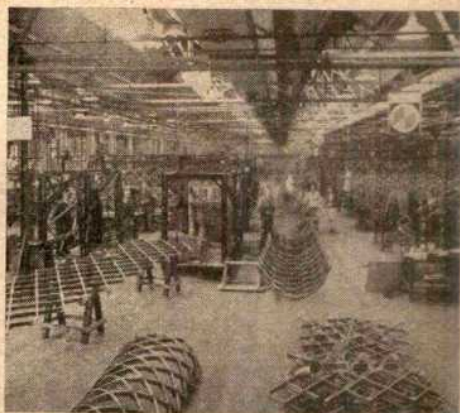
John takes the chair at meetings, but he is no dictator. Schemes are put up, and thrashed out and pulled to bits. His own schemes, often the results of hours or days of thought, are just as likely to be torn to shreds as anyone else's.

His personal motto is the homely Lancashire phrase that you must learn to "carry corn." A horse that has too much corn gets indigestion, and similarly, a man with too much power or success can get swelled head.

All the time John Moores reminds himself of that, although (or perhaps because) he is honest enough with himself and others to admit that the primary satisfaction he gets from his business is a sense of power.

He enjoys that power, but he is modest and unselfconscious about it because he is too much interested in the job and the fight to think of his own importance.

He has that "common touch" that can never be acquired. It means that he is never



Another Littlewood venture—and no gamble — Wellington bombers from Liverpool

cut off from the mass of ordinary folk to whom he belongs. He knows how they think and act and he understands them because he is part of them.

That makes him a very real person, whose authority is integrated with the folk around him, who is never pompous or pretentious but who has the second matchless gift of vitalising those around him.

He knows his people, and it is a fixed principle of his that he is accessible to any one of them, no matter how humble. If they want to see him on any matter relating to their work they can do so. And they do. This, he believes, is one reason why there has never, in peace-time or during the war, been a strike at any of his works. If there's a hitch or extra work that means working late, he goes to the mike and tells his workers about it himself. "Well, girls, it looks like another hour or two." It always works.

If an employee isn't making good at his or her job and admits it, it isn't the Littlewood way to get rid of him. He is probably a misfit. The matter is talked over, and he is given a chance elsewhere. Somewhere in the organisation there is a place for the man with brains and application: it's the business of the firm to find out the right place if things aren't going as they should.

The general Littlewood set-up runs true to form—it goes on paper as tidily as an equation.

Pools, the original enterprise, soon involved the running of a printing works, because the need for self-sufficiency within your organisation is a firm belief of Mr. John. He has had his own traffic department, his own building firm.

The systematic mailing of forms to vast numbers of people, and the placing in some of their hands of considerable sums of money, pointed to the next venture being something that used these facilities for contacting people and also assisted them to spend the money. The mail order business was the answer.

Experts were consulted on organisation. Manufacturers were visited. John Moores went to the U.S.A. and spent days walking through chain stores from end to end of New York. Then he got busy with pencil and paper. It was characteristic of him that he got as far as compiling a full catalogue of suitable goods (with the aid of his family and seven or eight friends), before he brought a single bit of Direct Mail organisation into being.

But once created it went on oiled wheels, and was soon handling 130,000 orders a week.

The whole system was scheduled, and so was every job within the system. By weighing the mail when it arrived in the morning it was possible to tell how much work there would be that day.

The working week was planned in relation to that, certain days being long, ten-hour ones, others short. Peak day for mail was Tuesday, while the end of the week was slack. Time study methods meant that everyone worked a full unit hour and the week's work usually ended by mid-day Friday.

Nobody sat idly at their desks or benches. If the schedule showed the day's work was done they went home. If idleness was due to a bottleneck somewhere, that bottleneck was opened out.

If, for instance, a certain number of cata-

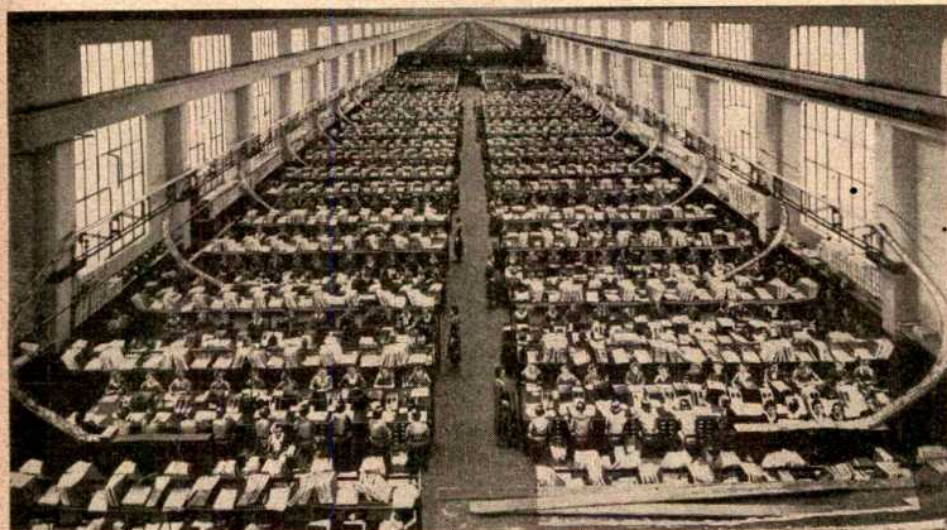
logues had to be sent out, the time needed for this was calculated and a time fixed before the jobs were put in hand. So many people would need so much time for it. Likewise every order as it came in was timed for going out—if opened at 9 a.m. it would be marked to go out at 1 p.m. Multiple orders were broken up so that every item in them got on to the conveyor belt from different departments at the same moment.

Out of stocks are the curse of the mail order business, leading to hold-ups in the warehouse and inevitable confusion. To obviate this John Moores introduced the punched card system as a means of controlling stock. If 10,000 coats were put in the warehouse, 10,000 cards were punched and set out on trays that slope to aid convenient handling. Orders could thereby be checked against stocks at the initial stages.

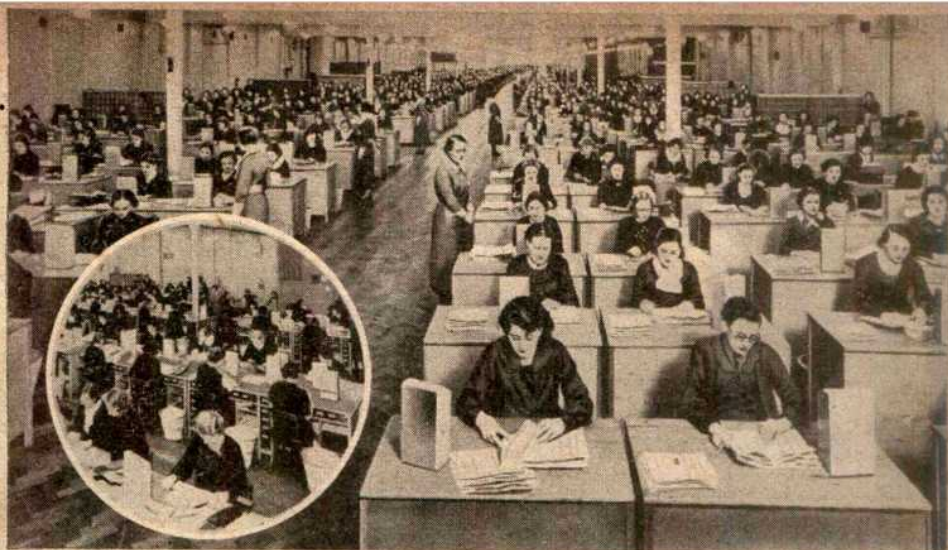
A money-back guarantee is necessary with mail order goods, to allow for misfits in apparel. People are bad at measuring themselves, but instructions were compiled. Returns are less than 3 per cent.

Most mail order business is done through clubs, an organiser collecting weekly subscriptions and purchases being made in rotation. Littlewoods held regular meetings of their organisers throughout the country. They would hire a room in an hotel. Mr. John would address the company, invite suggestions and complaints. By his side his advertising manager had a card giving details of each man and woman present, and a note would be made of the kind of people they were and the kind of complaints or suggestions made.

It was a curious point that the main motive in becoming an organiser was not usually



Not only "Pool fans" but methodical business men must be amazed when they see such evidence of painstaking systemising. Note, left and right, the flow of conveyerised mail



Good office layout makes a tedious routine scrutiny job easier for both clerk and supervisor. Modern equipment and furnishing add to the efficiency and amenity of the job

profit. It was the desire to get to know people, to make friends among the neighbours.

Wherever there is Littlewoods there is a Planning Department and an Inspection Department. The former works out schedules, prepare bulletins in which, in duplicated sheets bound in a fat volume, there are laid out the exact duties of every worker in every Department.

Every new employee masters his or her own. The Planning Department looks after the Time Study methods, of which the actual employees are quite unaware. They merely know that the flow of work goes on smoothly and that any panic rush of frustrating delay is adjusted as soon as it occurs.

If delay occurs at any point in the day's schedule the office manager is called in by the head of the department concerned, and he calls in the Inspection Department or "Trouble Squad." The latter steps in. Sometimes one of its members will spend a week in one department studying three or four workers, to see just where the bottleneck is located. Once found, it is opened out. The office manager does not take over again until the new arrangement is in full working order.

This illustrates another cardinal principle of John Moores. Detail must be delegated. "Small men fall down on detail by failing to delegate duties," he says. "Know every detail yourself, then forget it. Be prepared to delegate it."

In any case, for him, the fun is gone from an enterprise once he has established it. He is ready then to hand it over and to pass on to something new.

The newest thing, just before the war, was chain stores. Once again, it seemed to grow

out of mail orders. It was another way of selling things on a large scale. Stores were opened in Blackpool, Brixton, Birmingham, and were leaders of many more. Sites and buildings were difficult because big open spaces were needed where people could move about readily.

Lofty ceilings, bright lighting, fine floors were also felt to be important, and soon Littlewoods were building their own stores. The Oxford Street site was valued at £500,000. A site in Glasgow worth £26,000 was bought, when war broke out and stopped development.

In this case too, business was put down on paper. After the cost of the store and the cost of running it was ascertained, calculations were carried out to find out how many running feet there were in the store, and exactly how much money had to be taken per foot of store space per week throughout the year.

This meant that certain rules had to be set down concerning goods stocked. The chain store had to get in early, and "plug" lines hard, to sell cheaply and then get out quickly. It could only play the winners—for instance, in men's shirts no browns were stocked and no sizes over 16½. Women's shoes were sized only between 3 and 6. The public eye had always to be caught.

The war decimated the Littlewood business proper but triumphantly vindicated the principle of running a business by system and schedule. The first contract, for 20,000 parachutes, was received when Littlewoods had no machines, no operatives and no knowledge of the job. But soon 200 machines were in full working order. Balloons and

Please turn to page 98



LOOK-OUT for NEW IDEAS

● **Two In One.**—Upper floors and ceilings can be constructed together by means of the invention of a Worcestershire man. Intersecting joists or beams support the floor, the structure providing a number of rectangular openings

below the floor in which a corresponding number of domed, precast, rectangular ceiling panels are placed.

● **Joint Effort.**—A new compound enables cutting steel or sintered carbide to be united by brazing with a baser metal at such a temperature that the physical properties of the metals are not affected.

● **Spring In The Air.**—A method of partially collapsing aircraft undercarriages during retraction has been patented by a British company. In this way, the undercarriages are stowed more compactly.

● **Full Stopper.**—A vehicle braking system for trolley buses has been invented by which, should the vehicle be held at a stop on its power brake, the electric brake will be cut out and overheating of the motor field avoided.

● **Built-in Television.**—Television sets are standard fittings in flats now being built in Moscow, according to an American reporter broadcasting from Moscow. Also from Moscow comes news of a machine which can produce enough artificial silk in 24 hours for 2,400 pairs of stockings.

● **Explosive Rivets.**—Details of one of World War II's big time-savers—the explosive rivet—have been given in the Du Pont Magazine of America. Inside the rivet shank is a small explosive charge which can be touched off with an electrically heated iron. In about two seconds the charge is fired, the shank expands, and the rivet is fixed permanently in place.

● **Leading Lights.**—A way has been found of maintaining the required relative positions of a number of night-flying aircraft. A lamp is mounted so as to floodlight a surface of

the leading aircraft which is visible from an accompanying aircraft only when that craft is in a pre-determined position.

● **Fire-Proof Textiles.**—Textile materials made of or containing fibres of an organic derivative of cellulose and of good resistance to flame have been brought out by a British firm. The materials are impregnated with a solution of urea and an ammonium salt in a solvent.

● **For the Diabetic.**—There is a new preparation of insulin which, when administered subcutaneously or intramuscularly, will produce a reduction in the blood sugar level lasting for a longer period of time than would a similar injection of insulin alone.

● **Bigger Banger.**—A more satisfactory method for mixing fuel spray with air in a compression ignition internal combustion engine has been discovered by a Bromsgrove man. The air passing into the cylinder and/or the air within the cylinder is electrified with a charge opposite in sign to that carried by the sprayed fuel particles.

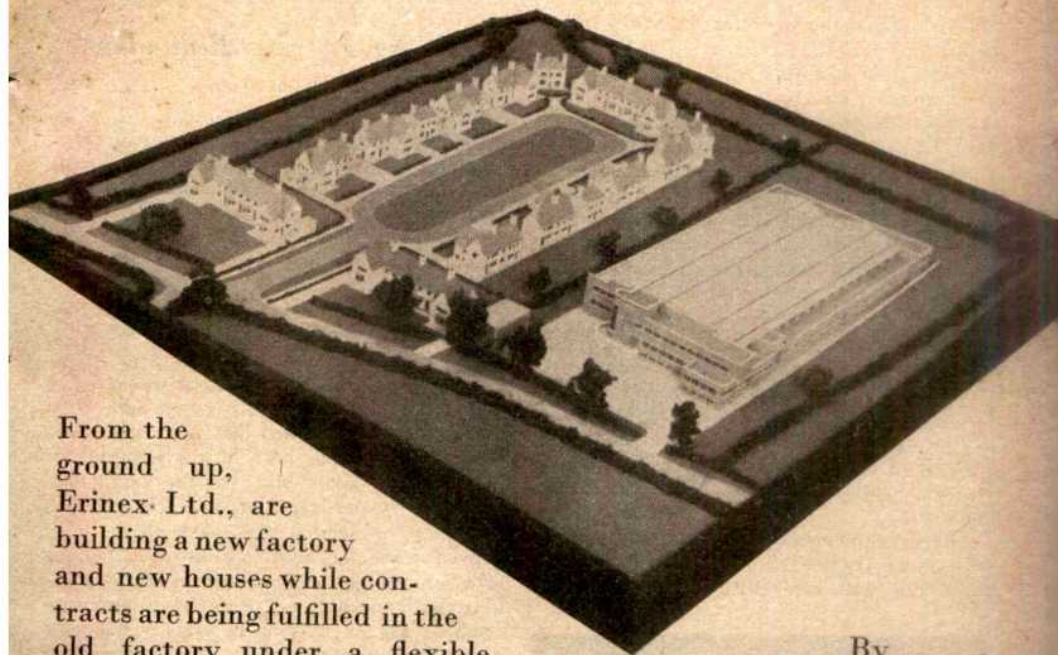
● **Paper Furniture.**—The Russians are planning to mass-produce furniture from paper treated by a special process. It is stated that the furniture will be very light, but strong and comfortable.

● **Fine Cutter.**—Wire is safeguarded from damage during trimming in a new hand-operated device for paring insulation from electric cables of various gauges. The novel part about the device is that the amount of movement of the lever when pressed down is determined by a graduated adjustable stop. The stop has a rotary movement and can be turned to the registered position immediately for the particular cable to be trimmed.

● **Quicker Shipping.**—The loading and unloading of cargo vessels may be speeded up considerably by an American idea for equipping ships with demountable holds or cargo platforms. Ships and docks would have to be specially equipped, but it is claimed that the demountable holds and platforms would be particularly useful in the discharge of cargos other than bulk material, i.e., vehicles, machinery, or general package freight.

“Increased P.M.H. can Balance Our Economy”

New Factory — New Houses



From the ground up, Erinex Ltd., are building a new factory and new houses while contracts are being fulfilled in the old factory under a flexible switch-over programme

By
BRIAN CUMMINGS

WHEN a small firm switches from the production of incendiary bombs to the production of electric kettles in two months—that's reconversion! When, in another three months, it is producing 2,000 kettles a week together with many thousands of smaller electric appliances—it seems like a miracle.

None of this was done without opposition. Women had never been welcome in industry, despite the fact that they do some jobs far better than men. Proof of the pudding is in the eating. With the part-time assistance of local women and girls, Erinex produced over twenty million parts for the Ministry of Aircraft Production. They made the whole of the Mark III and Mark IV incendiary bomb, and the case and all the workings of the parachute incendiary bomb—the "J" type.

They also made parts for flame throwers, and were responsible for many of the inventions connected with that weapon. Research, indeed, has always been a strong link in the organisation. During the war it meant that the company was called upon for advice in connection with all kinds of ammunition. It

has also enabled them to get well ahead on the design of their peace-time products.

Until September, 1945, the company was wholly engaged on war contracts. By November half of them had been completed. That was the beginning of the switch-over. Even then they knew what they were going to make for peace-time purposes. Their first big job was to produce electric kettles.

But imagine their problem. Their war production had been done in hole-and-corner premises all over the village—in a wash-house, a barn, a Salvation Army hut, an old butcher's shop, a garage, and an old priory at Geddington. They had no tool room, not even a draughtsman.

In November they found a draughtsman. A bootmaker's shop, which had been functioning as such during the war, was taken over and turned into a tool-room. The Salvation Army hut, which had been the inspection department, was turned over to production. An assembly department and a drawing office were built.

All this meant the installation of electricity

and the building of benches. It was like setting up a new firm. But it was only the beginning of their difficulties. The wives, widows and young girls, who had been working at Erinex during the war began the return journey home to keep house for their men. And remember, those women had constituted almost the whole of the firm's labour force.

A situation like this was enough to make any managing director pack his bags and shut up shop. Not so Mrs. Channell. Foresight, alongside a thorough knowledge of engineering, had always been the touchstone of her success. This had been borne out by the contribution she and her workers had made to the war effort: it was to be proved again in the way they tackled their reconversion.

It was no accident that Mrs. Channell went to Flore to set up her war factory. She knew, from visits to her week-end cottage, that the little village was the centre of a wretchedly depressed area. In her opinion it was second only to Jarrow as a black spot of unemployment. Unless a man could get some kind of job with the B.B.C. at nearby Daventry, all a man could do was casual labouring.

The development of Erinex brought prosperity and renewed hope to Flore. Was it all to end, with the return of the women to

their homes? Of course not. If country women could be taught engineering, so could men. There was no law which demanded that they should all return to a life of drudgery in the fields. They too could be given the opportunity of learning a skilled occupation which brought in a decent wage.

Ethic No. 1. No Redundancy

The company started on the principle "No redundancy." A job was found for every worker who wanted to stay. Women were gradually moved over to light assembly work; then a rehabilitation scheme was set going for all men returning from the Forces who wished to join the firm.

Mrs. Channell has a profound belief in the value of adaptability.

"Industry," she says, "has ever been content to teach a man one job and then leave him doing it for the rest of his life. Why? It is almost a matter of chance which job a man is taught, and if you change him from one to another you will inevitably see where his natural aptitude lies. Moreover, think of the value of adaptability to the small concern. If 75 per cent. of the operatives in one shop or section are taken ill, as may happen if one gets an infectious or contagious disease, men can be drawn from others parts of the organisation to keep things moving."

There is no reason, in Mrs. Channell's opinion, why other firms should not start similar rehabilitation schemes to her own. Erinex had no special instructors, certainly no special premises. It just meant a little time and patience on the part of the management. And it has proved popular with the workers. It began with 15 men from the village. Now there are 75 trainees and a waiting list. In one day recently there were 40 applicants.

But good as it is, the rehabilitation scheme alone was not enough to solve the labour problem at Flore. Decent houses were needed for the workers. Here again Mrs. Channell's remarkable foresight came into play. In 1941 she saw the bombing in the Midlands, and realised that when peace came it would not be sufficient merely to find and train workers. They would have to be housed.

When the company had been in Flore just one year, work was begun on the planning of a new factory. The County Planning Department was approached and asked if it would be possible to erect a combined factory and housing estate when peace came. Approval was given, the land was bought, and a firm of architects was engaged to work on the preliminary sketches which Mrs. Channell had prepared.



The ideal drying cabinet for the housewife who lives in a flat—one of the many new products

When a problem arises it is dealt with on the spot—by Mrs. Channell, the draughtsman and tool room foreman—here a problem with electric kettle handles



The site, which is situated in open country, is divided into two exclusive parts for the factory and the housing estate. The factory will have a workshop area of 30,000 square feet, with the principle entrance, administrative offices, demonstration show-room, buying department, drawing office, in the front.

Planning Began in 1941

The housing estate is separately approached from the main road, and comprises 32 houses—detached, in pairs, and in blocks of four. The aspect of each house has been considered so as to give the maximum amount of sunshine to the principal rooms. Gas and electricity will be supplied to each dwelling, and points provided for fires, washing machine, refrigerator, etc. A scheme is also under consideration for the supply of hot water.

Work has begun on the site. The roads, sewers, and electric light and gas mains have been put in. Even so, progress has not been fast enough for this firm. As usual, shortage of labour is the problem. And as usual, the company has found an answer.

Through the British Legion, a proposal has been made to the workers that they should help build the houses in their spare time. (It is considered that between them they will have had enough experience in the Forces to undertake some of the simpler operations in house construction). Seventy-five per cent. of the workers have volunteered for the scheme. Of the rest nearly all are unable to do such work owing to age or infirmity. And if this scheme is not sufficient, the civil

engineering division will undertake the whole job themselves.

The labour and housing problems solved, all other reconversion troubles faded into insignificance. "We had no other problem," said Mrs. Channell. "Materials? Well, we had to get materials at short notice to keep the workers going. So we dug around until we got what we wanted. If we couldn't get what we wanted, we found a substitute. The same applied to plant: if we couldn't get a machine, we made it. That's the way, isn't it? There's no such thing as 'can't.'"

I myself saw that happening in connection with electric kettles and a new kind of plug. But the problems might just as easily have been raised in connection with immersion heaters, toasters, electric irons, or any other of the hundred and one electrical household appliances which are being or will be made at Flore.

Among the more startling products to which I heard more occasional references were all-glass cookers and a drying cabinet which promises to be ideal for the housewife who lives in a flat and has nowhere to hang the washing. Planning for production of these articles is well advanced; meanwhile the immediate aim is to produce 5,000 kettles a week.

Somehow, one leaves Flore convinced that every plan that has been projected will be put into effect. What is the secret of success? Nothing more than is implicit in this story. Mrs. Channell calls it common sense. But having seen other firms in the throes of reconversion, I found Erinex's method of tackling the problem uncommon sensible.

Business Calling . . .

Quotes the Policies of Men Planning Britain's Prosperity

Mr. HERBERT SMITH *Plant Re-organisation*



B RITISH Ropes, Ltd., are to reconstruct a large part of their plant and machinery. Mr. Herbert Smith, the chairman of the company, states: "Plans for this work are all made and in the hands of the executives of the company to be carried out; it will probably take two or three years to bring to fruition all the reconstruction we have in mind, and I am

convinced that there will not be a better plant in this country, and very few in the world to equal it, not only as regards mechanical efficiency, but in the quality of goods manufactured.

"Alongside all this re-organisation of plant it is essential that the same spirit of enterprise should be shown by all the employees of the company; the dead hand of restrictive practices and objection to labour-saving devices must be overcome, and if we are to have a higher standard of living then it is necessary that there should be a higher standard of production both in quantity and quality—I lay as much emphasis on the second of these as on the first."

Mr. Smith adds a word in praise of trade associations of manufacturers. "The exchange of ideas of a technical nature is of very great service to the country as a whole as well as to the individual trades concerned. The meeting together at intervals of a body of men engaged in the same occupations and with a common end in view is indeed resulting in a co-ordination of effort without which I believe industry in this country could not be nearly so efficient as it is to-day."

Mr. KENNETH M. CHANCE *More About P.M.H.*

IT is very seldom that you can find an industry in which comparative P.M.H. index figures are available. Because of this, certain statements by Mr. Kenneth M. Chance, the chairman and managing director, at the annual general meeting of British Industrial Plastics, are of absorbing interest. We make no apology for reproducing them at some length.

"Nowadays one hears on all sides of output per man hour having fallen," he said, "so I have had some figures taken out for a comparison of the only product upon which a fair comparison can be based between 1940 and 1946. In January, 1940, when we were working flat out for export, it took rather more than 28 process workers, all of whom were men, to turn out a certain unit of production.

"In January-February, 1946, rather less than 25½ process workers, of whom 20 per cent. were women, turned out precisely the same quantity of the same product in the same plant in the same time. The corresponding figure for January, 1939, when production was on normal lines, without any special urge for output, is 35.

"Now let me give you figures showing the result of this work. Taking the weekly production during the financial year ended September 30th, 1939, as 100, the production of moulding powders in October, 1945, was 158, in November, 182, and in January and February of this year the weekly average output was exactly double that of 1939; and in March it was still further increasing.

"On the same basis sales to home customers rose from 100 in 1939 to 233 in the first two months of 1946, and during the first three weeks of the month of March were double the average rate of sales for 1939 both for home and for export. Essentially the plant is the same, and this large increase in production is due to the combined efforts of staff and workpeople in promoting efficiency."

Mr. H. CECIL BOOTH *Portrayed in Royal Academy*



A NEW and—for an industrialist—somewhat novel distinction attaches to Mr. H. Cecil Booth, F.C.G.I., M.I.C.E., chairman of the British Vacuum Cleaner and Engineering Company, Ltd. Mr. Booth has recently had his portrait painted by the well-known artist, Mr. David Jagger. The portrait is now being exhibited "on the line" in the Royal Academy,

which opened on Saturday, May 4th.

Mr. Booth is, of course, best known as the inventor and patentee of the vacuum cleaner.

His experience goes back to the days of the first vacuum cleaners, which were installed in horse-drawn vehicles and went from house to house, the apparatus being connected by pipes from the van through the windows of the house to be cleaned. To-day, "British Vac." produce the famous Goblin electric cleaners, which are used in households throughout the country.

Mr. WILLIAM HARRISON *Controls Have Their Uses*

A WORD on behalf of controls comes from Mr. William Harrison, LL.B., Chairman of Thomas Owen and Company. "The paper industry," he declares, "like nearly every other industry, is still under Government control, so that one of our chief raw materials, wood pulp, is supplied to us through the Ministry of Supply, and the prices of our manufactured products are also regulated by that department."

"I am of the opinion that this Government control of industry, in so far as the supply to us of imported raw materials is concerned and the fixing of prices of our manufactured goods, is likely to stay with us for a considerable time, and I think it would be disastrous for an industry like ours if control was taken off the purchase of our imported raw materials, such as wood pulp."

"The control of the purchase and resale of wood pulp for the whole industry by the Paper Control is, in my view, a sure shield against any great increase or sudden fall in this important commodity. After the last war there was no such control in the purchase of wood pulp from abroad and prices of this raw material soared in a fantastic way, and in 1921 prices fell with dramatic suddenness and with crippling effect on the industry."

Mr. L. J. CADBURY *Problems of the Transition*



IN most industries one of the chief problems of reconversion is how to find labour. Some firms, however, are experiencing difficulty in absorbing men and women returning from the Forces because shortage of materials prevents an immediate return to full pre-war production. Such firms will find interest in a statement by Mr. L. J. Cadbury, the chairman of Cadbury Brothers, Ltd.

"It was our hope," he says, "that demobilization might have coincided with an increase in the production of our factories, but owing to the restrictions on the supply of raw materials, this has not proved possible. When such an increase takes place we shall be able to find employment for all our returning ex-service men."

"Until then we are trying to find work for them in other directions. Just as in the war a substantial part of our factories, technical staff, and labour were used for the production of munitions, so in this difficult transitional phase we are taking on the production of domestic appliances and other work. For instance, at one of our works we are making wringers, at another a large multi-storey factory has been turned over to work for pre-fabricated houses."

Mr. OLIVER LYTTELTON *Future of Electrical Industry*



STRIKING confirmation of the argument for more horse-power per man in electrical motors in British industry which appeared in last month's *BUSINESS* is to be found in a speech by the Rt. Hon. Oliver Lyttelton, D.S.O., M.C., M.P., the chairman of Associated Electrical Industries, Ltd.

"The world has entered a new scientific and industrial era," says Mr. Lyttelton. "Its horizons are continually expanding in front of our eyes, and in no field will more startling developments be seen than in the electrical industries. I think it may well be that in the future one of the simplest and most revealing indices of a country's life and vitality may be provided by the amount of electrical power per head of the population which is generated."

The contribution of A.E.I. to this new world is described elsewhere in the speech, from which it appears that the company has built up a lively and enterprising research organisation at Trafford Park and Rugby. This organisation is to be expanded yet again, and a laboratory will be devoted exclusively to long-term research. The laboratory will serve as a focus of new knowledge in the physical sciences.

Mr. JAMES EWING *Praise for the B.O.T.*

THAT much abused body, the Board of Trade, comes in for a little praise from Mr. James Ewing, chairman and managing director of the Bradford Dyers' Association, Ltd. "I should like to say a word of praise of the Board of Trade utility schemes as applied to cotton, rayon, and wool fabrics," he remarks. "Apart from setting an excellent standard of quality, which is in the interests of the consumer, the system has benefitted producers considerably by affording bulk orders and a concentration of types; both factors of immense value in reducing the manufacturing costs and prices."

"The success of the schemes could not have been achieved without the co-operation of distributors and producers."

Executives' BRAINS TRUST.

The first Question is . . .



Regaining Staff Zest

1 For twelve months now I have been working against what almost feels like a rising tide of inefficiency among the executives of my business, which is the production of motor and aero accessories. The old enthusiasm has completely gone. How can I restore the fine team spirit among my chief people? Most of the colleagues who built up the business have died or left us, but younger men trained in the business have taken their place.

Executives have wide personal discretion, but must secure the sanction of a committee to get decisions. There is no threat of nationalisation.

MR. FRY: I suppose such a situation to arise through a deficiency in (a) the men, (b) the way they are organised, and (c) the way they are led. It is easy to jump to conclusions but I think I am on fairly safe ground in suggestion that the latter might be worth investigating.

The conditions as I see them are that there is a team of comparatively new and young executives, they are obviously the same men who previously performed their jobs satisfactorily—they may even be doing exactly the same job as before—but it would appear that they have a new status revolving round the wider personal discretion which has now been given to them.

There also appears to be some sort of committee organisation which is probably new in this concern. The third condition is the difficulty of making any product today.

I think that such conditions call for intimate, continual and very able leadership and I am just wondering whether this is not a case when the founder Managing Director has retired from active control of the business and devolved his responsibilities to these new executives in a new type of set-up, and thus left this group of executives short of adequate leadership.

The situation can also be described in another way; we have here a new group of executives, the same men as before, but now forming a group of an entirely definite char-

acter, and they are now in the process of working out group relationships. It is obvious from the little that we know of group behaviour that such a group cannot be left with satisfactory results to sort out these relationships themselves, neither can the group exist for long without a natural leader. The natural leader is of course in this case the Managing Director or somebody appointed with full authority, responsibility, and accountability. If the Managing Director is unable to exercise his executive authority and leadership then he must appoint somebody to do this for him.

MR. DAVIS: Where you have a company built up by founder members, the personalities of those members are certain to have had wider scope and have left a mark on the methods of that business. If you break up that inner circle of founder members who have a close personal relationship with the managing director, the newcomers—no matter how able they may be—can never, in the eyes of the managing director, fill the shoes of the older men.

QUESTION MASTER: But the questioner is not complaining about his directors' efficiency, but about the general spirit in the business.

MR. DAVIS: I feel that the former executives must have had a rather undue share of total responsibility, and the newcomers, by virtue of working through committee, will not have the same personal contact and therefore have not, to the same degree, the confidence of the managing director.

QUESTION MASTER: That does not apply in this case because this man is not appearing at work as much as once a week. The young men have the business in their own hands, and can do what they please with it.

MR. FRY: I say the answer is that the business of getting production is more difficult today than at any time I can remember. Such a situation calls for leadership which only a managing director can exercise, whether he has under him a committee or a number of individuals with wide personal discretion. If there is this situation in any firm today, the vital factor is the quality of leadership by the managing director.

MR. GODDARD: The whole thing boils down to a very simple issue, that of maintaining the driving force. We see it frequently, if we trace the history of the company which has started with a founder and a few people with him. When they started the business they were fired with enthusiasm. They built it up, and in course of time, they faded away or retired. Then the business passes through a phase such as we have described in this question. If the business has been planned correctly in its fundamentals, it will come through. But when such a phase appears, the

**QUESTION
MASTER**

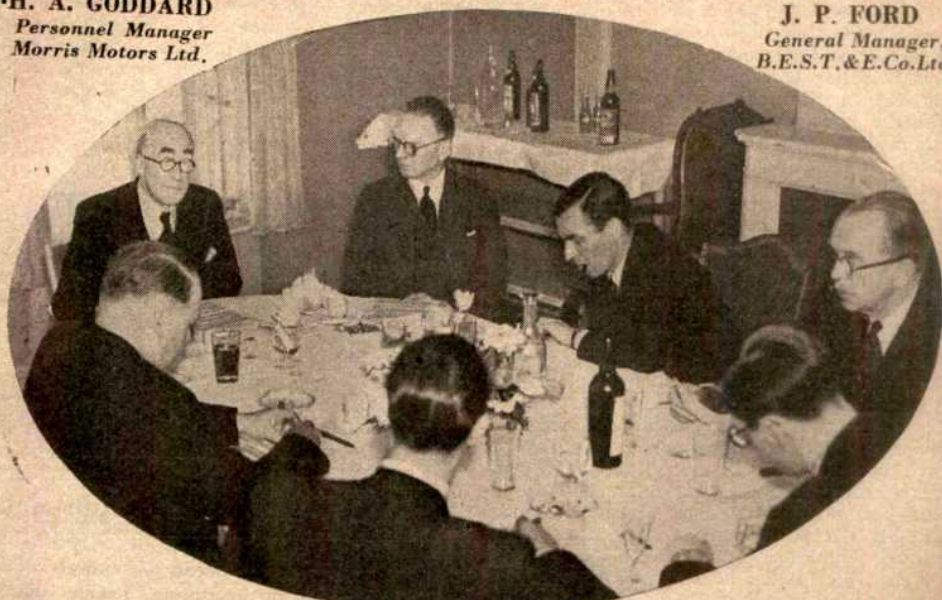
H. A. GODDARD
Personnel Manager
Morris Motors Ltd.

E. A. LEVER
The Pressed
Steel Co. Ltd.

REGINALD W. FRY
Methods Executive,
Murphy Radio Ltd.

JOHN MARTIN
Secretary
I.C.I. (Paints) Ltd.

J. P. FORD
General Manager,
B.E.S.T. & E. Co. Ltd.



founder of the business should say to himself, "How much is this phase a reflection on myself? Does it mean that my old enthusiasm has gone? I may not think so, but that is probably what has happened."

QUESTION MASTER: How can you get around that? Northcliffe said that any successful business might become "money-logged" after the first 30 years. The older directors had much money and were tired: the younger were not ready for the load.

MR. LEVER: It has to be done from the top. Mr. Goddard put his finger on the sore spot when he said that the man at the top is not doing the job he was doing years ago.

QUESTION MASTER: No top executive can continue for ever. I think every reasonably important executive should have an understudy in training, whether he is close to him or in another department. That is what is done in America, but you don't find it often in Britain.

MR. FORD: If the managing director was there every other day of the week and organised his executives to act under his general control, there would be no need for the committee.

MR. FRY: You cannot take a managing director's function and distribute it among five or six people. Authoritative co-ordination is implicit in managing directorship.

MR. MARTIN: It is impossible to get a committee to act as an individual. So many men, so many opinions. In this sort of business, the function of a committee of executives should be to put forward a recommendation to the managing director. Four or

five executives, who are probably specialists, get together and discuss a topic. But they cannot put anything into effect without going to the managing director, because generally speaking each only sees his particular side of the problem.

MR. FORD: They should give their general manager authority as their chief executive and build him up. If he is not big enough for the job, they should find somebody who is capable of being built up.

QUESTION MASTER: Surely you are making very heavy weather with this. You have already given three methods of replacing the managing director. Personally I know concerns where each one of the three methods has worked successfully. (1) Give one executive with general or secretarial training, the position of general manager. Give him full authority to make decisions, referring only very difficult or major decisions to the retiring managing director. He must then take the chair at most departmental conferences. He must have the final voice in most senior appointments. He must have a certain amount of control over the financial department.

It is useful for the managing director to make an occasional appearance and so far as possible, to support the decisions of the general manager and of the committees which he chairs.

Specialist directors should be able to appeal against a major decision of the general manager which one or more of them think unsound. But the managing director must support the authority of the general manager

wherever possible; otherwise chaos may result through division of authority.

(2) The managing director can reconcile himself to a period of several years during which he will appoint a joint managing director with himself who will be the active organiser and stimulator.

It is better for them to occupy adjoining offices. In this way, the young managing director can know everything that is passing across the desk of the old chief and *vice versa*. Tactful secretaries are essential for each of these top executives.

It is useful too for the old chief to vacate the chair in the middle of a committee meeting and leave it to the younger man and *vice versa*.

(3) It is possible for the old chief to leave all the decisions to his directors, the departmental and specialist chiefs. This is not so impossible as it sounds, with the chief largely absent. The Americans have developed an admirable technique whereby the young, keen executive, of exceptional and wide experience in other companies, as well as his own, acts as liaison and deputy for the managing director. In this case, the chief practically never takes the chair at any committee meeting except when matters of exceptional urgency come up. But he must keep in close touch, either at his home or through weekly visits to the business, with his young co-ordinating officer.

This scheme looks superficially like No. 2, but the difference is that, in this case, the deputy has much less authority than No. 2. He is not the joint managing director. He does not make the important departmental decisions although on the other hand, he does do much co-ordinating.

The heads of each specialist department will tend to pass their decisions on to the committees dealing with their own work. The danger is that decisions may be made which are departmental in nature and yet affect other departments.

This is where the young co-ordinating executive comes in. He must have enough personality to be able to state the wider issues, but at the same time he can call for support on the chief of any department whose efficiency is threatened by a decision based on the needs of another department.

MR. FRY: I cannot, of course, quarrel with plans (1) and (2); they are methods of selecting and training a natural leader for this group of executives, endowed eventually with full responsibility, but as to (3) I would like to say this. I spent eight years with three American Managing Directors operating under such a plan.

The lowliest conception of the job is illustrated by the title "Assistant to the Managing Director"; the highest conception, the equivalent to a Chief of Staff in military organisation; not yet titled in industry.

The nearer the job gets to the latter conception the more likely it is to be successful and the nearer it approaches the former conception the greater the chances of failure.

I would not recommend such a plan to meet this situation. From experience I know just how difficult it is to integrate the personalities in the new type of set-up, and to write terms of reference, for everybody concerned; it seems that until the co-ordinator establishes himself (whatever he calls himself) as the delegate of the Managing Director does the system appear to work.

We're Not Too Sure



Wanted—The Right Approach

2 We have come across an entirely new difficulty in recruiting female office staff after E.W.O. relaxation. Girls and married women who worked contentedly with us during the war have taken advantage of the relaxation of E.W.O. We missed them so badly that we have been compelled to start a campaign to get them back.

The first interview usually runs smoothly enough, until we come to terms. We are then asked, "How much would you pay a man, if you could get a man to do this job?" In other words, they demand equal pay for equal work.

The whole staff has been organised during the war in the Clerical Workers' Union. If we accede to this request, it is obvious that we should incite a movement for higher wages right throughout our female office staff. Does the Brains Trust know of any means of avoiding this certain trouble, and at the same time recruit these women whom we need?

MR. FORD: What does he mean by the whole of the staff being organised during the war in the Clerical Workers' Union?

QUESTION MASTER: Previously, it was an open shop. Now every woman is in the Union.

MR. FRY: As far as I know the Clerical and Administrative Workers' Union has not so far insisted on equal pay for equal work as in the case of their so-called manual colleagues; in fact I think there is a conference about to be called on new rates for age for both female and male clerical workers up to 25 which have a differential rate for males and females. So that I think bringing in the union is rather introducing a red

herring; in other words, there appears to be no union backing at the moment for a request for male rates by females.

MR. DAVIS: The implication is that if they accede to this request, they will create a precedent, because the rest of the staff is organised in the Union.

MR. FRY: If a girl asked you how much you would pay a man to do the job, you would reply . . .

MR. MARTIN: . . . it is not a man's job. What has it got to do with you?

They Don't Think So



QUESTION MASTER: This is the problem. Before the war, they employed men. During the war, they employed women. Most of those women have left, and they are wanted back. It is then that they ask "What would be a man's pay for the job?"

MR. MARTIN: In the Clerical Workers' Union, there are grades of pay according to age. Perhaps a girl of 20 could do the job, and it is only worth the rate a girl of that age would get. If a woman of 35 comes for the job and asks what a man would get, the answer is "We could get a girl to do it."

MR. DAVIS: The trouble is that there was no grading pre-war.

MR. FORD: Is it not something that is going to sort itself out as the labour situation gets easier?

MR. FRY: There has been a recent award to clerical workers of 4/- a week to females and 6/- a week to males; this appears to support my contention that there is still discrimination in union negotiations between males and females.

MR. FORD: Should not the organisation get together with the Clerical Workers' Union and ask them what they consider to be a fair rate for the job, both for males and for females? I don't believe that the Union lays down equal wages for equal work.

MR. MARTIN: Some of the other unions are making a differential there. A woman doing a man's job is usually rated more than 75 per cent. of the man's wages.

MR. GODDARD: The difficulty is summed up in their statement that they are compelled to start a campaign to get the women back. An employer who has to go on his hands and knees for labour is in a jam, and there's not much he can do about it.

MR. FRY: And in those circumstances, you must pay a premium, whether the labour is male or female.

Top Men Together

3 In our organisation, the sales manager and the advertising manager appear to work in separate and water-tight compartments. As a responsible executive, I feel that this may in time have had effects on the firm's sales. I am, therefore, trying to get the two men together—not under one direction, but in one co-ordinated department. Has the Brains Trust any experience of this kind of problem? If so, can they offer any advice?

MR. LEVER: I hardly think that this question ought to arise if the right men are in the right jobs. Sales and advertising must be closely related and, in fact, the only purpose of commercial advertising is to increase sales.

A large undertaking can afford a sales director, whose work includes co-ordinating that of the sales manager and the advertising manager; in other cases the managing director, or even the general manager, will do this work. But in most concerns it is the sales manager who will be responsible for the marketing and merchandising of the company's products.

This work includes keeping close contact with the advertising department so that campaigns can be arranged to suit the sales programmes.

It is obviously necessary that the sales manager is a big enough man for this work. He must understand the use of advertising and not treat it casually. Above all he must think in terms of markets—actual and potential—and not just in terms of customers.

MR. DAVIS: How do you co-ordinate the experimental and sales functions? I have in mind a company where the advertising manager does not come under the sales manager but under the managing director. This company has a development and design subsidiary. I suggest these three functions, which all have sales promotion as their objective, can only be co-ordinated at Directorate level.

MR. FORD: If the sales manager of the main company is a big enough man he is usually brought into the picture when new developments are pending.

ANSWERS—Verbatim



Please turn to page 114

How One Firm Planned to Get Back to Sound Costing Values

From A Consultant's Case Book. No. 2

By JOHN W. HENDRY, F.R.Econ.S., F.I.F.M.

THERE is more in reconversion than meets the eye. That goes for every firm. For example: everyone knows that today we describe conditions prevailing as a seller's market, and therefore, whilst competition is still not right in the forefront of the plans for switchover, the firm which refuses to face the prospect of competition will, without doubt, be labouring under severe disadvantages.

Costs can make all the difference between the advantageous and the disadvantageous position in the competitive market of tomorrow. And here I am examining the case of a concern manufacturing domestic appliances, who whilst tackling their switchover, were confronted with a heavy order book at home and a practically impossible export demand at the same time.

The management knew something about production for their war record had not been unimpressive, but now that the reconversion programme was in full swing, difficulties had arisen, difficulties revealing costs which were too high and labour which seemed to be failing in productivity compared with its wartime achievements.

A ready assumption is that the cost of labour (32 per cent. above 1939) was a contributory, if not the whole, cause of the high costs. In 1939 the average cost per unit

produced was 11/3d, and the oncost was 180 per cent. At the time the investigation was made, the average unit cost was 18/5d., and the oncost was still 180 per cent.

Accordingly it was decided to institute an "efficiency audit" (see BUSINESS, March, 1946) in order to locate the faults.

Bad Habits Had Grown

They were manifold. The revelations demonstrated that: Indirects had risen from 33 per cent. to 41 per cent.; machine loading was only at 50.5 per cent. efficiency; raw material was held in stores for indefinite periods; scrap was high due to "feeder" faults (16 per cent.); job costing showed loss/profit ratio too late for remedial treatment; manhour output was operating at 72 per cent. efficiency; tooling was indifferent resulting in low machine output; idle time due to machine breakdown amounted to 11 per cent. of direct hours; waiting time due to shorts accounted for 5.72 per cent.; the fastest selling line was a loss-potential.

What had happened was that during the previous six years, new standards had been unconsciously set. Managers had absorbed a new philosophy, that of "production or else"; workers had been paid high wages based on arbitrary values; supervision had more and more relinquished their decisiveness to higher levels due to ministerial complications; the drawing office had absorbed the close limit complex consequent upon having to produce piece-part drawings that demanded tolerances down to half a tenth.

Above all these factors however was the dominant one that economics had ceased to play an important part in production technique. The habit of working from the book had become so ingrained that it reacted right through the organisation.

PERCENTAGE OF BONUS PAYABLE (P.I.G.L.)												
Earned Performance	1st Week	2nd Week	3rd Week	4th Week	5th Week	6th Week	7th Week	8th Week	9th Week	10th Week	11th Week	12th Week
75	10	8	7.5	6	4	2.5	-	-	-	-	-	-
80	12	11.5	9	8.2	5	3.2	1	1	-	-	-	-
85	14.5	13.0	12.0	11.5	9.0	7.8	6.0	4.0	1.0	-	-	-
90	16	15.0	14.0	12.5	11.8	10.0	8.2	6.8	4.0	1.8	-	-
95	18.2	17.5	16.5	15.0	14.0	12.8	11.8	11.0	7.5	4.0	2.5	-
100	20.0	19.0	18.5	17.5	17.0	15.0	14.2	12.5	12.0	9.0	6.8	3.5
105	22.0	22.0	21.0	20.0	19.0	18.5	17.5	16.0	15.0	12.5	11.0	8.5
110	24.0	23.5	23.5	22.5	21.8	21.0	20.0	19.0	17.5	16.8	15.0	12.5
115	26	26	25	25	24.0	23.5	22.5	21.8	21.0	20.0	18.2	16.5
120	28.2	27.5	27.5	27.0	27.0	25.5	25.5	25	24	23.5	22.5	22.0
125	30.0	30.0	30.0	29.0	29.0	29.0	28.0	28	27.5	27.5	26.5	25.5
130	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	31.0	31.0	31.0	30.0

SLIDING SCALE

The following plan was decided upon:

(a) For the time being the number of lines being carried would be reduced from 17 to 9. This would enable long runs to offset the uneconomic batch production.

(b) Raw material intake would be budgeted on 14 days' consumption. This would reduce the need for excessive storage and cut down on handling time.

(c) Production control would be instituted to offset the poor progressing, poor shop and machine loading. This would raise the cost-recovery rate on the machine tools and reduce idle time and waiting time.

(d) Indirects would be pruned by reducing the inspection stages, loosening the standards (push fits being all that was required). The wages and costs department would be merged, together with the commercial departments. This would save filing, calculator capacity, stenographers and office space.

(e) The tool room would be re-organised. For the time being press tools would be put out to a precision works in order to get greater tool life. The present inadequate toolroom capacity would be used to overhaul all existing tools.

(f) All work would be time studied and when the appropriate efficiency had been reached would be bonussed.

(g) Simplified budgetary control would be introduced to detect and spotlight profit leaks.

Before all this could be put into operation, the managing director had to issue directives and at the same time give a talk to the supervision in order that everybody might be made fully aware of the reasons for the re-organisation.

How Time Study Helped

The first stage was to convert the varying types of component being produced to a common denominator in order that adequate comparisons could be made. This was achieved by using time study to set standard values on the work so that a unit hour, represented in effect, some part or parts of the whole; this multiplied by the average labour rate and plussed by the overhead immediately showed, against any given selling price, whether that particular line was profitable.

This unit value was also used to budget the labour, load the shop, load the machines and to establish the percentage of *effective* machine loading.

The translating of the various components into unit-values also threw up the efficiencies of the shops. These values were additionally used to balance the types of operations accurately so that no time should be wasted through over or under producing.

Inside two months, the tempo of the workers had been increased up to 98 per cent. effectiveness. In other words, the output per man hour over the whole works was only two per cent. short of the break-even point for the wages paid.

At this stage the bonussing of the work, based on saving time, was instituted.

There was still a long way to go to achieve the optimum performance which was based on 130 per cent. efficiency and which was in effect asking for an enhanced output of no less than 80.5 per cent.! This could not be obtained in one leap so to encourage the operators and to make the attainment of part of the target remunerative to the operators, the scheme was introduced on a sliding scale (see fig. 1).

This had the effect of offering an immediate reward for increased output. It also stimulated the other sections by reason of the quicker the consumption of material the more rapid the work flow, both as regards the progressing of parts and their transit via shop and department.

The low machine efficiency was handled by means of an incentive.

This was based on the theory that for every idle machine, dependent on the cause and the length of time, its capital cost and its maintenance charges, so the bonus payable would be less.

FIG. 11.

Machine	Value £	Loading Factor per cent
A. Ward (2A)	600	80
B. Herbert (O)	290	64
C. Drill Press	30	72
D. Guillotine	400	32
E. 40-Ton Press	700	28
F. 30-Ton Press	950	25

Let Value be V.
Let Load Factor be LF.
Let Man-hour be C.

$$\text{To reconcile } \therefore \frac{V \times LF}{100} = X.$$

$$\text{And unit cost} = \frac{1000}{X}$$

It will be observed that this correlates the percentage efficiency to the value of the machine. It shows that the higher the cost and the lower the efficiency, the less the cost recovery factor.

Applying the formula to example shown, we now have:

$$A. \frac{600 \times 80}{100} = \frac{(1000)}{480} = 2.08 \text{ units.}$$

$$B. \frac{290 \times 64}{100} = \frac{(1000)}{185.6} = 5.40 \text{ units.}$$

$$C. \frac{30 \times 72}{100} = \frac{(1000)}{21.6} = 46.30 \text{ units.}$$

$$D. \frac{400 \times 32}{100} = \frac{(1000)}{128} = 7.8 \text{ units.}$$

$$E. \frac{700 \times 28}{100} = \frac{(1000)}{196} = 5.1 \text{ units.}$$

$$F. \frac{950 \times 25}{100} = \frac{(1000)}{237.5} = 4.25 \text{ units.}$$

Under this scheme it will be observed that the relatively low valued drill press (c) is given a higher unit repair value than all the other machines.

A SIMPLE FORM OF BUDGET FORECAST & CONTROL (FIG. 11)

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)		KEY
Standard Hours	Hours Taken	% of Effcy.	On Cost & 15% %	Labour Cost	Budget in £s.	Profit	Loss	Dept.	
1946	1600	121.3	2560	563.10s.	620.10s.	57.0	-	46	(A) = No. of units by time allowed for target.
									(B) = Clock hours taken to produce (A) units.
									(C) = $\frac{(A)}{(B)} \times 100$
									(D) = $\frac{(B)}{100} \times 158$
									(E) = $(B) \div 2/6d - (C) - (D)$
									(F) = $\frac{(A)}{100} \times (D) \times 2/6d.$
									(G) = (F) - (E)
									(H) = (E) - (F)

Fig. 3. Key values are shown in tinted portion

It is obviously desirable to keep the more expensive machines running at full blast than for example a lowly priced arbor press.

An example of this scheme is shown in (fig. 2).

The point may be questioned as to the desirability of offering an incentive to such workers as the maintenance men, but in this factory where over 70 per cent. of the work done was performed on machine tools, it was to be expected that if the operators increased in tempo so that the machines were governing, in the final result, the output.

Consequently, in order to prevent undue or invidious comparison between operators' and setters' maintenance functions, it was deemed expedient to ensure that, based on the increasing efficiency of the shops and machines, so all engaged in the contribution to this end should be suitably rewarded.

Objection v. Object

The first set-back was that despite the sliding scale offered, the operators rejected the targets set, claiming that they were too strict and that their attainment would impose too much strain.

It was appreciated that this was not so, but management could not ignore the fact that this complaint existed at least as a symptom of restlessness and therefore could only be ignored at great risk of discord.

The operators were not organised. There were some trade unionists amongst them but it was by no means a closed shop.

Accordingly the operators were asked to nominate three representatives to attend discussions with management. The workers agreed to this and a small committee was formed to handle the situation. It was discovered that the main reason for the antipathy was not that the targets set were difficult to attain, but that there were two real fears, they were: (a) The workers felt that this was the thin edge of a cleavage designed to cut wages and that the rates set would be subjected to change as soon as it was obvious that the operators were making bonus. (b) They felt that such treatment would mean that some workers would be unemployed as soon as the production rose.

These were relatively easily handled, but

care had to be taken not to destroy confidence so the following agreement was posted in the shops. "The management are aware of the feeling that the reorganisation, accompanied as it is by an incentive scheme, is creating feelings of uncertainty about the future.

"Once the targets are set in the shops, the allowed times will not be changed unless the method of production or the standard set is altered and this change will not be effected except after 14 days' notice of intention to alter.

"This firm is under staffed by operators. Therefore unless there are reasons for disciplinary action, it can be safely said that no operator at present employed is likely to lose his/her employment due to the increasing production. This is naturally subject to normal conditions obtaining within the industry."

The Figures Proved . . .

This notice had the effect of silencing the criticisms and from that time forward, the re-organisation went ahead without any further discord or friction.

As soon as the standard values were accepted, it was then possible to introduce the elementary budgetary control (see fig. 3).

The results were worthwhile.

The operator efficiency rocketted to 143 per cent. and stayed there. The indirects were reduced from 41 per cent. to 22 per cent. Rejects fell to 2.9 per cent. Internal handling came down from 19 operators to 7. The total process time fell from an average of 20 days per batch to 8 days for a like amount.

In all the average unit cost fell from 18/5d. to 11/7d. The oncost only fell 22 points however, but this was due to the money spent on replanning and layouts being spread over two years, so in fact there was an exceptionally high cost-recovery factor.

TREND OF TRADE

Settling Down to the Job

BY D. C. TERRETT

Economic Consultant

THE first year of peace has shown gratifying progress in the production of peacetime manufactures. The next twelve months should see a substantial increase in the flow of supplies reaching the public.

Most notable gains have been in the capital goods industries, particularly in the production of building materials. These gains should be reflected this summer in real progress towards meeting the housing shortage.

The number of new homes under construction more than doubled between December 31st and March 31st, when 40,900 permanent houses were being built by Local Authorities. In addition 215,000 sites were being developed or were ready for building operations to begin.

Good news also comes from the shipbuilding industry. New vessels being built at the end of March totalled 1,676,103 tons gross, the highest figure since June, 1922.

Only about 6½ per cent. of those vessels are for sale or registration abroad, so that their ultimate earning power will be a useful source of foreign exchange, as well as removing the bottleneck in shipping space which is a threat to the improvement in exports.

The Trade Returns continue to make satisfactory reading. It is interesting to see that

new groups of manufacturing industries are now coming to the fore.

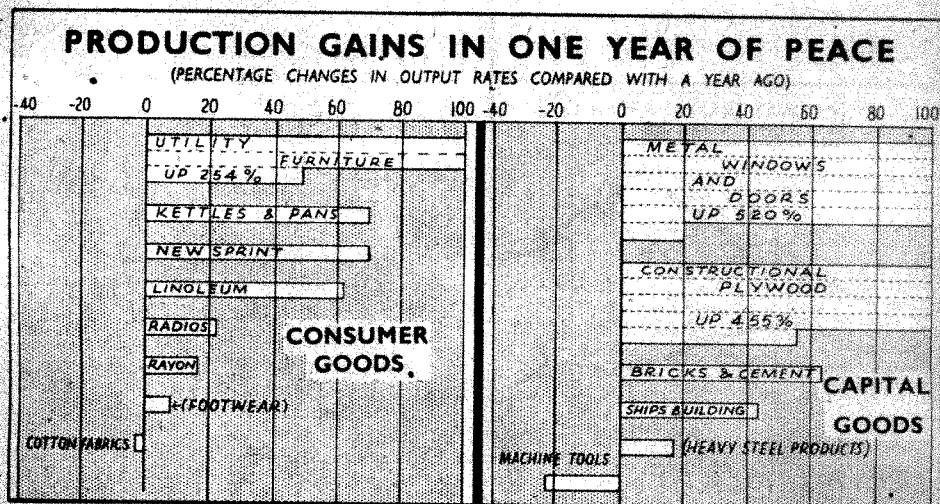
Before the war the big earners among our exports of manufactures were machinery, cotton, vehicles and iron and steel manufactures. These industries were exporting during the first quarter of this year at rates ranging from 22 per cent. (for cotton manufactures) to 70 per cent. (for iron and steel manufactures) above the level of 1938 on a value basis.

Cotton manufactures have now slipped back from second to fifth place as an earner of foreign exchange. Chemical manufactures now exceed cotton in value of exports, having gained 85 per cent. on 1938 rates.

The most notable rise was the advance in the export of electrical goods and apparatus to 120 per cent. above 1938 values.

It is all to the good that these industries are going ahead and that we are relying less on our coal and cotton exports, as there is a world-wide tendency for our former markets for these products to become more self-sufficient in their fuel and textile requirements.

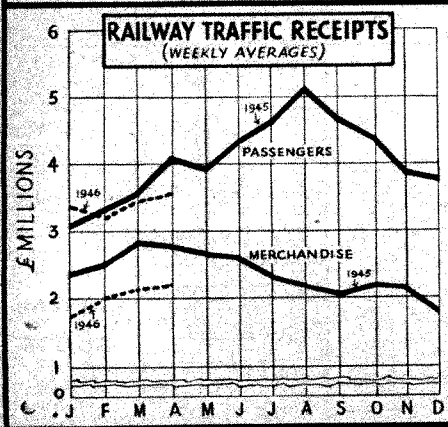
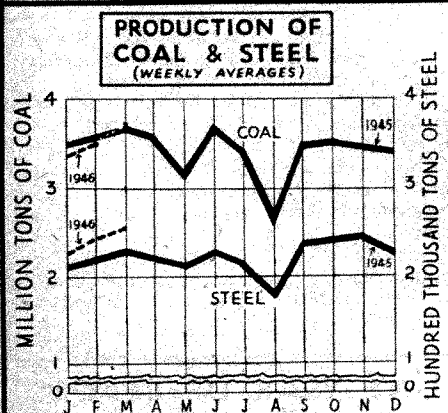
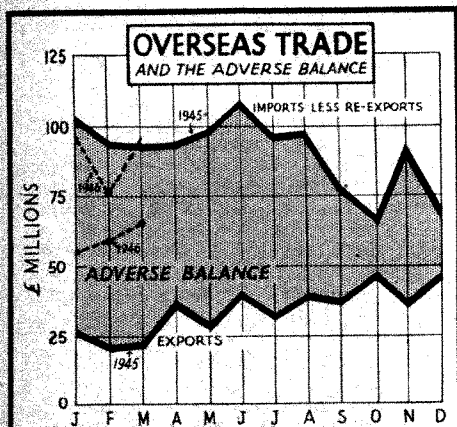
Further, the P.M.H. factor is much higher in the newer industries, and their exports therefore yield more foreign currency per manhour.



COAL PROBLEM

The coal situation is a little less in the mind of the public in these summer days, but it is still a harassing problem for industry.

During last summer the total of distributed stocks rose from ten million tons in May to 13½ million tons by October. This year the figure started at 6½ million tons.



Industry is consuming over 10 per cent. more than a year ago, and is certain to increase the rate of consumption still more over the next few months.

The increase in industrial stocks therefore must come out of more production. If this is not forthcoming there is every prospect of a crisis next winter.

A continuation of the steady rise in steel output would be ruled out, and there would be repercussions throughout industry.

STEEL SETS TARGET

Steel output is now running at the rate of 13,300,000 ingot tons. This rate is above any previous peacetime level, but in its report to the Government the Steel Federation anticipates that this figure will be little more than normal by 1950-55, while they expect exports to reach three million tons.

The Federation is aiming at a total capacity of 16 million tons to meet this demand.

The bulk of the additional capacity required will be built in Scotland, the North East Coast and South Wales. The biggest proportionate increase in capacity however will be in Northants, where it is planned to raise present output potential two-and-a-half times, so that this area will then account for approximately 8½ per cent. of national capacity compared with the current 3½ per cent.

RAILS—GOODS LEVEL OUT

The trend in railway receipts from passengers after allowance for the seasonal rise over Easter is slightly downwards.

Merchandise traffic receipts have had a horizontal trend in recent months in contrast to this time last year when they were falling rapidly from the all-time peak reached in March, 1945.

On the other hand licenses issued for commercial motor vehicles have reached the highest level since the outbreak of war, with 470,000 vans and lorries on the roads compared with 480,000 in August, 1939.

RETAIL FIGURES

Retail trade continues on a high level with Central London still leading the country.

Sales in the North of England are about the same levels as a year ago, while the Midlands and Wales show a slight fall. In contrast, the sales in London were up during March by 27 per cent. on the previous year.

Turnover in the furniture, household goods and hardware departments show rises over the previous year of 85 per cent., 60 per cent. and 54 per cent. respectively.

Apart from the Christmas peak the total index is now at the highest point recorded.

Stocks are keeping up well and now average 20 per cent. above the levels of a year ago.

WAGES AND PRICES

The index of wholesale prices only partially reflects the advances in non-ferrous metal prices. Industrial materials and manufactures and building materials still have to reflect the increased prices of lead, zinc and copper.

Prices of industrial materials and manufactures are now 76 per cent. above the level of August, 1939, while the increase in building material prices over the same period averages 57½ per cent.

In spite of the rising level of wages, the number of working days lost through industrial disputes has doubled in recent months. During March 267,000 working days were lost, mostly in connection with disputes over wage rates.

Higher wages are not necessarily inflationary if accompanied by increasing output per man hour. There is, however, no evidence of this.

The result is that, with higher prices for clothing, motor cars, bricks and prospective increases in railway charges, there is a growing danger of inflation getting out of hand.

It is clearly time for the Government to make known its policy for wages and prices.

EMPLOYMENT

Well over a million workers are now engaged on orders for the export trade compared with 930,000 in mid-1939.

The number of workers in the building trades at 960,000 is still well below the pre-war level, and there is acute shortage of labour in the brick industry.

Labour shortage is the governing factor in a whole range of industries, including coal mining, but nevertheless one in every ten of the insured population in South Wales is unemployed.

The number of workless rose further during March in North West England and Scotland. The Midlands and the North Midlands show a slight decline.

It is probable that we are now passed the peak of transition difficulties and that unemployment in Wales, Scotland and the North should show some decline during the rest of the year.

BANK CLEARINGS

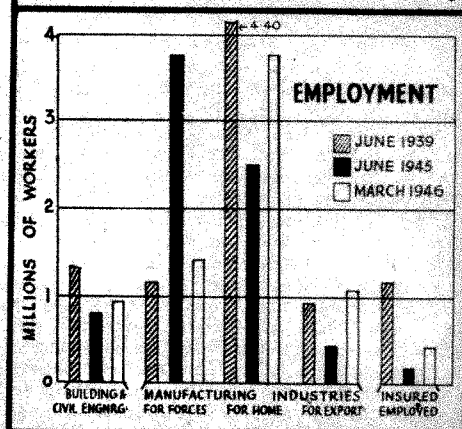
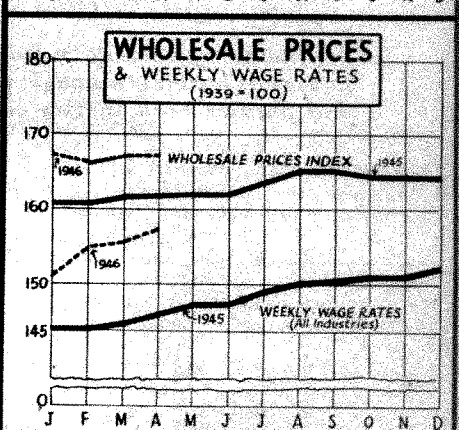
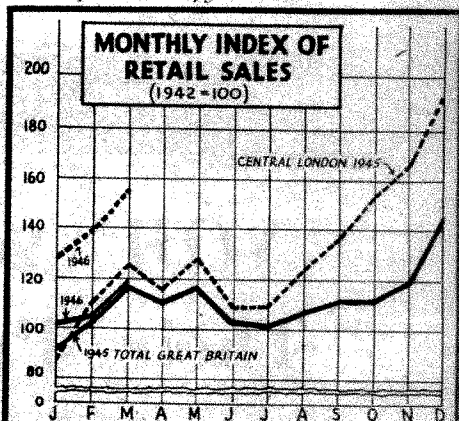
The total of Provincial Bank Clearings to date has reached £427 millions, compared with £355 millions in the same period last year, an increase of approximately 20 per cent.

Birmingham has seen a 60 per cent. increase in its cheque clearings compared with last year. Hull takes second place with an increase of 29 per cent.

Bristol comes last on the list with an increase over last year of only 3 per cent.

EXPORTS:—United Kingdom exports amounted to £69,363,000 in April, an increase of £2,305,000 over the figure for the preceding month.

Owing to the Easter holiday, April was a shorter working month than March. Taking 26 days as a uniform basis, the rate of export has risen since the beginning of the years as follows: January, £59 million; February, £65 million; March, £67 million, and now April with £75 million.



BUSINESS IN WESTMINSTER. Every day the influence of Whitehall and Westminster on business grows. **BUSINESS** has asked Thomas Creevey to interpret Parliament and the official scene for its readers



NOW YOU KNOW Their Programme

THOMAS CREEVEY

pen name of an able back-bencher, is an expert on certain phases of business management with experiences of business and politics both in this country and in the United States

THE nationalisation of iron and steel will complete the Government's programme of socialisation designed for fulfilment during its present term. Business men can rest assured that barring the most unexpected development, the extent of the Labour Government's legislation for the transfer of industry from private to public ownership is now known.

Details of the legislation for iron and steel, gas and electricity, and transport, are yet to come, but at least those engaged in production outside of this field can rest content that their ownership will not be interfered with during the life time of the present Government, which because of its large majority is likely to run its full term to 1950.

What comes after that will depend on the electors, before whom the Labour Party will have to make out its case for further nationalisation before it receives a renewal of its mandate. By then, also, nationalisation will have had a run and the public will be the better able to judge whether a further dose of it is desirable and necessary.

Iron and steel may well prove the key to this. The lack of definite plan for the nationalisation of the industry causes concern on both sides of the House of Commons. Legislation is some way off, and meantime it is difficult to see how the industry can be

expected to develop and produce with enthusiasm.

Uncertainty as to just where nationalisation stops within the industry is among the most disturbing factors. If it be confined to basic production, segregation of ancillaries may upset the whole structure of the well integrated concern, and if, for that reason, in such cases the Government decides to take over the ancillaries too, then the industry will be a muddled mixture of public and private ownership. The steel debate will no doubt clear the air somewhat but until the detailed legislation is presented to Parliament uncertainty must remain.

Meanwhile the Government goes ahead with its programme, ignoring the pleas of M.P.'s for a reasonable night's rest occasionally. The Coal Bill, after several late sittings, got its third reading. Debates on the Bill, both on the floor of the House and in committee, brought out a critical attitude towards the Government's present nationalisation methods.

There is a growing body of opinion among its own supporters that the present legislation merely transfers ownership without assuring that plans for industry's operation under the new management will bring advantages which will be readily realised and appreciated by the workers, the consumers and, ultimately, the electorate.

Private enterprise has the advantage of personal service and direct management. That is to say, each firm deals with its customers on a personal basis, knows their requirements and caters for them. In the same way, each concern is responsible for its own organisation and so decisions can be taken on the spot. With nationalisation on its present basis, each of these individual concerns comes under the centralised control and management of the Board appointed by the Minister.

Local responsibility is abolished and personal relationship with the consumer goes too.

Danger—'Passed to You'

The more acute and younger element on the Government back benches are aware of this, and are pressing upon the Government the necessity to look again at the proposed structure of nationalised industry.

To preserve the two great advantages of private ownership within nationalised industry, they suggest decentralisation and consultation with consumers. With regional organisation, and the delegation of responsibility, except of course on matters of policy, to the local managers, local needs and wishes could be taken care of and a closer identification of management, workers and consumer with the nationalised industry achieved.

The Coal Bill provides for two consumers' councils, for domestic and industrial users respectively, but in the debate it was argued from both sides of the House, that they did not provide for the inclusion of all most vitally concerned with the industry, and most knowledgeable about it. Similarly, regional organisation is left entirely to the Board, whereas many would have had it provided in the Bill.

The great danger of nationalisation is that it results in centralised control and management, which in its turn leads to bureaucracy throughout the industry.

Bureaucracy means that no one will take responsibility, but will refer every matter on which decision is necessary to the next in the official line that stretches from the factory or pit to Whitehall. Consumers no more than workers will stand for that. Hence, the minor revolt among Government back benchers who want to see nationalisation succeed, not fail for the very reasons that its opponents have always produced.

Meanwhile, in the sector of industry that is to escape nationalisation, the reports of working parties may soon be expected. Some are awaiting the President of the Board of Trade's return. The Government will study these reports before they are published; and they will then almost certainly become subjects of Parliamentary debate.

If, as is more than likely in several cases, the spending of vast sums on reconstruction is involved, Government assistance will be forthcoming; but it will carry a small measure of control with it.

In the Borrowing (Control and Guarantees) Bill the Treasury can guarantee loans up to £50 millions, but provision is made for such guarantees being made on terms, and the Chancellor during the Bill's passage through Parliament indicated that terms would include Government participation in the firm concerned, in some form or other, to ensure control over the expenditure of the money. Until these reports have been digested, published and acted upon, no more working parties will be appointed. Sir Stafford Cripps gave that assurance some time ago.

The President's return is eagerly awaited as the situation at the Board is unsatisfactory. Herbert Morrison, who deputised for him, has neither the time nor the experience to deal with its affairs; Dalton who deputised for the deputy during his absence in the United States and Canada, is equally occupied elsewhere but had the experience. The Parliamentary Secretary, John Belcher, is inexperienced and therefore cannot take responsibility for major decisions.

The man who has been carrying the burden and carrying it well is H. A. Marquand, the Secretary for Overseas Trade; economics professors do not often make good administrators, but Marquand is the exception. Credit goes to him for the most satisfactory recovery of export trade. Co-operative, tolerant, considerate and willing to learn from the more experienced business man, Marquand has won their support. Export recovery is giving satisfaction but it should not be regarded with complacency.

Exports—Still Leeway

In volume and in terms of prewar values exports are still less than 50 per cent. of pre war. In terms of gold they are equal only one-third. They could be more, if all Ministers paid as much attention to the business man's needs as Professor Marquand.

Ministers in carrying through Government planning have too little regard to business planning. The latter is equally essential, but Ministers seem unaware of it at times, and will make rules and regulations over the use and allocation of materials which may upset carefully prepared plans and make fulfilment of export orders impossible.

A case in point was the new scheme of priority symbols for all building materials instituted by the Ministry of Works. Some manufacturers found supplies essential to export orders suddenly cut off when housing was given absolute priority.

Another reason for caution in viewing the trade figures is the American and Canadian loan position.

Until the former is through imports are at a minimum; but once the credit is available they will jump and their effect on exports will not be apparent for some time.

Raw materials, machine tools and other imports necessary to the export industries

Please turn to page 96

MANAGEMENT'S ROUND TABLE

TODAY the air is thick with problems for management from the top of the managerial ladder to the bottom. Everyone, it would seem from our

correspondence, is beset with some sort of worry. The pity of it is that so many of these problems whilst not insurmountable are at first glance extremely difficult to tackle.

Whether you turn to the daily national papers or the more sober and informative weekly journals, you are confronted with homilies, discourses, and arguments on matters ranging from the problems of P.M.H., incentives, psychological hangovers, on the part of workers, manual and clerical, from the war, wage policies internal and national, and a hundred kindred subjects all closely interwoven with the very stuff of business and industry.

WITH this issue the Executives' Brains Trust retires to take a two months' break. For more than three years now, Question Masters, residents and guest members have met ten times each year.

Difficulties and problems, trifling sometimes, and frightening enough at others, have found their way to the Brains Trust table via the Question Master's desk. Three years, two of war and one of peace—at least peace in Europe—and this last year, June 1945-46, have yielded more than their quota of question problems. They have been every bit as tough and testing as any submitted when managements were beset with war-time struggles.

Perhaps one of industry's greatest headaches today is the result of a common war-time policy which demanded in every factory production at all costs. Anyhow, from letters to the Editor it is more than evident that managements all over Britain are confronted, not with one, but with two major problems out of a host of countless other difficulties.

What is more, these two problems are inextricably linked up in every case with those two words "production" and "costs."

Taking the problem of production first, it is fairly safe to say that every concern in the country from the greatest to the smallest has had to meet or is still meeting the task of reconversion. Many difficulties confront these managements as far as production is concerned. Shortage of labour of the right kind is universally felt. Shortages of materials vary from region to region, and from industry to industry, but there is one common

By the
EDITOR

factor on this question of production closely associated with the re-organisation that goes into every switchover. This applies particularly to the medium

and smaller concerns. To judge from our mail such managements are finding themselves up against one of the most unpleasant snags in re-organisation.

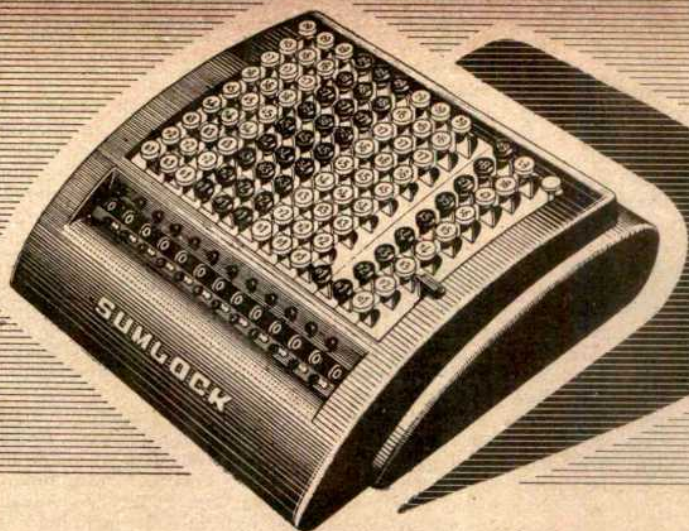
IT is a question of production plus costs. They feel and indeed they are right, that war-time usages and practices have crept into their organisation. They are aware that departments have expanded beyond reason. They conjecture that a great deal of this expansion is resulting in uneconomic overheads.

Alongside all this they place the overall national labour deficit. They know that the payroll is points higher than it need be, not regarding this question of course from the point of rates per hour, but from the point of numbers engaged in the plants. They are aware also that fellow business men and industrialists are desperately short of skilled help, but the trouble arises in applying the managerial knife, and at the same time maintaining good production relations with the remaining staff organization.

Then arises problem number two—cost of re-organisation. A decision has to be made. What action should they take, and how should they set about it? That about summarises the general tone of many letters reaching this office. Well, what about it? What should they do? At least some of them suggest calling in help from outside. These people would like to have the service of a good business or industrial consultant, but the question then arises, is this justified? What is it going to cost? Will the game be worth the candle?

IT can be done. Your business today, your plant, can be surveyed by a specialist. You can obtain the advice you need economically and with the assurance that whatever the result of the production and cost survey, the manifold percentage of what you pay will come back to the firm within one year of the re-organization.

There are of course consultants who stipulate fees for a preliminary survey, and then on that survey, base the amount of work to be done, but whilst this may suit those concerns to whom cost of re-organisation is a secondary consideration, it is far too big a



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commitment for the middle and small industrialists to gamble with. As readers of BUSINESS know it can never be the policy of this journal to grind the axes of interested parties, and it must be left to managements themselves to make the decision.

Of course there is the official side of the picture too. The Board of Trade's Production Efficiency Service are ready to tackle producers' worries. Every factory in the country can now get, free of charge, expert technical guidance on improving production methods, and no problem is too big or too small. Besides the Director of the Service, Mr. Frank Chappell, four Chief Production Advisory Officers have been appointed in the four main regions, Mr. H. J. Facer at the Board of Trade, London, Mr. J. Chilton, Birmingham, Mr. W. S. Cave of Nottingham, and Mr. R. Opie of Glasgow. Experts from the Regional Production Efficiency Service's offices will call at any factory and give employers advice on the spot.

AN old BUSINESS Brains Truster, Reginald W. Fry of Murphy Radio, recently gave a paper entitled "Budgetary Control and the Supervisor." I asked him for a copy which he very kindly forwarded to me, and although for reasons of space I cannot follow his arguments in any detail in the present issue, his treatment of the subject is one which we shall feature at length within the next month or so.

Chiefly his contention is that in this country budgets are a top management tool, descending perhaps down to departmental heads, but seldom lower. The Supervisor takes little part in the preparation or control of expenditure, and when things go wrong the resulting inquest—for that is what it amounts to—demands from the supervisors explanations of expenses based on events six months old.

In this way the budget falls into disrepute, for lack of break-down below the departmental level means that those who control production and costs by their actions get very little information, if any at all, as to the amount that may be spent in performing the operations they supervise.

Even in those cases where the budgetary control does get down as far as departmental allowances, it seldom reflects them in terms of supervisory needs; so much output in units—so many man hours and so on. Instead that technique is generally favoured which puts the responsibility for controlling expenditure on the departmental head, and he is the person who puts it into units and values representing everyday operations with which only the supervisor is acquainted, and who actually is the only person capable of getting the information out in anything like useful detail.

A NEW system, the result of research and practical experience, carried out by the Appointments Department of the Ministry of Labour aims at solving a big post-war prob-

lem for management. While staff shortages continue, the problem of getting young men and women with too little experience of work into the right kind of job, calls for urgent solution.

Many young people with initiative and high mental attainments, but lacking appreciable experience in civilian employment, are available. The matching of the candidate to the job, however, raises innumerable difficulties. Personnel offices have a good deal on their hands these days, and in any event, few enough of them are equipped to conduct a "scientific" appointment interview.

It was discovered that the most promising approach to the problem lay in the basic conception that all jobs are concerned, in varying proportions, with relationships with *People*, with *Things* and with *Ideas*. For clearer definition, the relationship with people was taken to mean managing, advising, persuading, instructing or simply mixing with people. "Things" covered designing, constructing, handling, and in any way dealing with concrete materials. It included indirect contact where knowledge of concrete materials and technical processes was necessary. Under "Ideas" came constructive thinking, such as planning, solving problems, training policy. From the detailed information contained in the Job Descriptions, each job was rated on a proportionate scale under these three headings.

THE applicant first records on a questionnaire, the main factual information regarding his past record and experience.

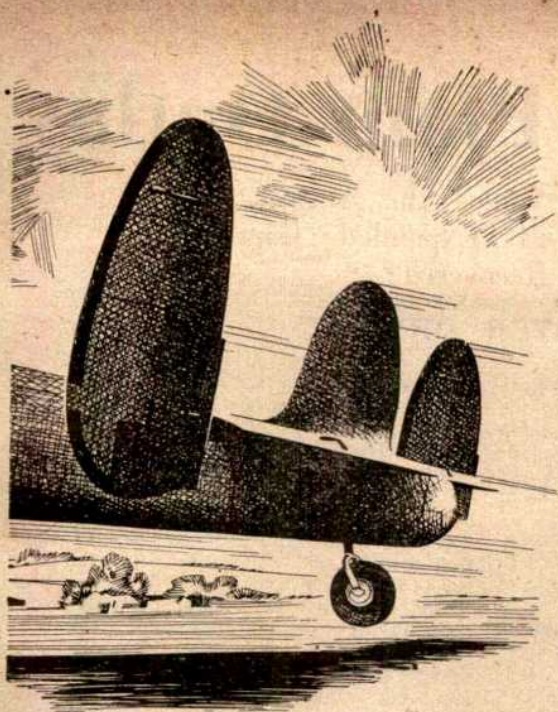
He next appears for interview. The interviewing officer bases his investigation on the information contained in the questionnaire.

This information by itself, of course, is no more than "bare bones." It is necessary for the interviewing officer to elaborate, verify and fill in gaps; and to probe into reasons, motives and preferences.

However, by relating his interview closely to the record of the applicant's past performance in all sorts of activities, the interviewing officer does make full use of what factual evidence is available and avoids the dangers of haphazard or purely intuitive judgments.

The object of the interview is not only to arrive at the applicant's classification group, but also to make assessments of personality features and special aptitudes and interests which will relate the applicant to a small number of specific jobs within the group. In order to achieve reliable results, the interview must be carefully planned. To assist further in this direction, an Interview Record Form was devised.

This guides the interviewing officer in the interpretation of the information which he has gained, and provides him with a systematised method of recording his judgments, impressions and predictions. It leads, finally, to the registration of one or more recommendations as to the most suitable kind of employment.



Flying start

Now that Britain is nationalising her airways, you may be feeling you ought to know more about us — B.O.A.C., the first national airline. Firstly, then, we are an airline in being. Once as Imperial Airways and British Airways, and now as B.O.A.C., we have been operating continuously since 1924. Today, on regular passenger services across the world, we are covering 700,000 miles a week. Our assets are very sound aircraft, a world-wide organisation — and a staff of incomparably experienced men. Our future? Had we only the last of the three assets to build it on, we should still feel confident: for experience is the only sure foundation. Aircraft will never be better than the men who fly them, engines than the men who service them. There are plenty of problems facing us, much hard work in a big expansion programme — and the friendly battles of healthy competition. But we have the men — and it's men that are going to count.



BRITISH OVERSEAS AIRWAYS CORPORATION

P.M.H. & Plant Outlay

From Output comes the Answer to
How Soon will Expended Capital
be Recovered?

By PETER DRYDEN

THE cost control and cost recovery factors appertaining to the usage of machine tools and their jigs/fixtures is bound up very closely with production economics. Today when man-hour output depends on proper machine utilisation, too much attention cannot be given to this important subject.

Unfortunately a great deal of misconception exists about the provision of tools. Undoubtedly man-hour output must be improved but to rush blindly into the dissipation of capital on mechanisation without thought to the cost of the job is sheer short-sightedness.

It must be remembered that the basic principles underlying both the acquisition of tools and the design of jigs is the amount of money that will be saved. In other words, just how soon will the expended capital be recovered?

As an aid to the assessment of this important factor, there should be a clearly defined policy, a routine examination of performance, a regular audit to determine the loss/profit position.

Signpost to Policy

There are several fundamental rules which will help in establishing this determination. They are:—

(a) What is the production programme? Is the part being made likely to become obsolete? Is it known how near obsolescence it is? If obsolescence is likely, can the design be modified to suit the needs of the substitute?

(b) How many parts must be run before the saving in man hours offsets the cost of the jig-fixture? Would a modified design saving less man-production hours cost less to make initially?

(c) After passing a given break-even point, what will the profit be before obsolescence causes the job to be broken up?

(d) What is the degree of maintenance? Will the improved design cause a rise in these costs?

(e) Will enhanced operator rates be required consequent upon increased skills?

(f) What will be the effect of the increased efficiency? Will the loading be more versatile? If so, what are the setting charges in relation to this factor?

As regards the provision of machine tools, it is imperative that before commitments are made and sanction given for ordering, that a most careful scrutiny be made of the costs involved. It does not always follow that to write off the cost of an old machine tool is going to effect immediate savings.

On the other hand, it is likewise important that in order to "sell" the board on the need for new machine tools that a budget be presented that will demonstrate exactly what those savings will be.

It will be observed from the chart here, that these are broken down to show the savings over a period of five years. In normal circumstances the cost would be probably written down over a period of ten years or in some cases over 20. It depends entirely on the tool design.

For example a jig borer could easily carry a writing down of 20 years, in fact in view of the close attention to limits on this type of machine and its high setting costs it is desirable that the recouping should be spread over as long a period as possible. On the other hand, with the ever changing design of lathe tools, it would be safer to recover the cost over a much shorter period.

The budget allowance of an extra 2½ per cent. will help in this factor bringing the depreciation down from 10 per cent. to 12½ per cent.

But the design of jigs and fixtures, this is a different story entirely. Here the prime cost has to be recovered, not over a period of years but over the life of the product. Today it is reasonable to assume that the life will be relatively long, solely due of course to the acute shortage existing for all consumable goods; but under conditions nearer normal, the cost of the tool or jig will have to be tied to within very close limits.

The jig or fixture should be designed so that there is maximum economy in its manufacture consistent with the labour expectation. In addition the maintenance charges must be closely watched; this governs the design to the extent of possible rejects through wear, breakages, storage risk and where small tools are being used, cutting edges.

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JIG AND TOOL ECONOMICS (FIG. 1)

MACHINE TOOL ASSESSMENT				M/C COMBINATION LATHE		BY P.D.	DATE 16/3/46	
Capital Cost (A)	Tax Allowance 12% (B)	Scrap Value of Old M/C (C)	Maintenance Old New 212 16 (D)	Output % (New x 100) (Old) (E)	Labour Rate Old New (& E) (F)	Gross Annual Saving (G)	Net Annual Cost (5 years)	Net Annual Saving
1,500	187.5	45	196	166%	250 150	296	291	132
$\left\{ \begin{array}{l} 212 - 16 \\ = 196 \end{array} \right\} \left\{ \begin{array}{l} \text{Product} \\ \text{Activity} \end{array} \right\} \left\{ \begin{array}{l} 250 \times 100 \\ 166 \end{array} \right\} \left\{ \begin{array}{l} D + \\ \text{Baloff} \end{array} \right\} \left\{ \begin{array}{l} A - C \div 5 = x \\ \end{array} \right\} \left\{ \begin{array}{l} B + D + F \\ - x \end{array} \right\}$								

The jig or fixture must:

- (1) Permit spot location to work site.
- (2) Prevent the component being inserted in any but the correct position.
- (3) Be strong, light, rigid and safe to use.
- (4) Prevent slip or chatter.
- (5) Be easily cleaned and serviced.
- (6) Where called for, embody ejection mechanism that must be foolproof.
- (7) Cut out handling time by being easy to load and unload.

This last is most important. There is no point in designing a jig to save production time if it is going to cost more in being handled. Jigs calling for a high degree of strength in loading and unloading will raise the fatigue ratio and thus defeat their objects which are to save time and increase productivity and machine utilisation.

The load and unload factors should be of no longer cyclic time than the cutting time unless there are exceptional circumstances for it will be appreciated that by this, the machine utilisation is halved and the cost recovery time doubled.

This is more particularly true on multi-tooling where considerable indexing and extended handling would preclude the loading and unloading being done in the machine cycle time.

In general, the more elaborate the tooling, the less adaptable it becomes, and the higher is the initial cost.

In order to find the economic difference between methods a careful analysis must be made. In general it will be agreed that the fixed oncost on a tool room will be about 200 per cent. so: Assume the cost of a tool in hours to be 16,

therefore 16 at say 3/- per hour	£2 8 0
Oncost	£4 16 0
Material cost	18 0
Total	£8 2 0

The handling mechanism this jig replaced was a machine vice and the time taken to perform the handling amounted to 22 sec-

onds. The new jig took an operating time of eight seconds so that the net gain was 14 seconds. The original time allowance for handling and machining amounted to two hours per 100. Therefore the new load on the machine was increased from 50 parts per hour to 62 parts per hour. As the machine operator's rate was 1/6d, the actual saving in cost/pence per piece is 0.067.

At this stage it becomes easy to determine the number to be run that will recoup the cost of the tool. It is approximately 29,000 and only if the total order exceeds this figure will there be any hope of recovering the tool cost. In practice, allowance must be made for the maintenance, storage, and internal transport so that this amount should be increased by 12 per cent.

Against all this must be set the increased rate of production which is 24 per cent. greater machine utilisation, but this only holds true if the machine loading factor is already tight.

More Export Effort

AN addition to the advance news about the activities of BETRO given in BUSINESS recently, is contained in a statement in the House of Common by Mr. Marquand. "Discussions between the Board of Trade and BETRO," said Mr. Marquand, "have resulted in a working arrangement and as soon as BETRO have been able to engage the necessary trained personnel for posts abroad and to send out special investigators, they will be in a position to provide for their members more detailed reports which will supplement the general reports which are made by the Commercial Diplomatic Officers and Trade Commissioners. To ensure the closest possible working between the Government services and BETRO, to avoid duplication of effort, and to give maximum service to exporters, a joint committee of the Department and that organisation will be set up to review results periodically and to arrange forward programmes.

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Office Efficiency

Good Manners and Good-will

CCOURTESY standards, it seems, have fallen low in the United States as well as here at home. Bad manners may be understandable, but they remain inexcusable. It is good therefore, to note any tendencies towards improvement.

An American concern brings home its internal reformation to its customers by having a special reply envelope which says "Thank You" in the upper left-hand corner. It is turning out to be an inexpensive, good-will builder for the firm.

The letter "T" is printed in red and a curved line from the final "U" runs down and extends to the customer's name.

They have been the cause of much favourable comment and it seems can give even routine business letters a personal touch. On the reverse side of the envelope, the return address is printed in three colours.

It is hard to get staff but . . .

WHETHER this technique will go over in Britain remains to be seen. It seems to have proved that it can work in America. In days of labour shortage like these, it is important to discover whether or not jobs can be found for people who lack specific experience, but who, during the war, acquired skills and aptitudes which indicate prospects of success.

A Buffalo U.S. industrialist, interested in finding jobs for such people, has opened what he calls a "Man-Marketing Clinic." It operates independently of the firm and is designed to deal with each applicant as an individual.

The experiment is still in its infancy and, the Vice-president of the company, the man behind the scheme, has discovered that out of 36 people interviewed, 40 had tried—with-out success—to find jobs commensurate with their bent and capability, through the established channels.

Here is the way he operates his scheme—we take a typical case.

An applicant—a discharged lieutenant—had worked, prior to war service, in an engineering plant at a job that demanded little skill. Our American business man puts the newcomer at his ease, offers him a smoke and opens up a desultory conversation.

The job-seeker, somehow or other, turns the talk to the subject of small boats. He

glows with enthusiasm, boats are his hobby. It is obvious that this man knows something about boats and motors.

After a little more conversation, Mr. Miller, our Vice-president friend, phones a friend who operates a marine engine repair department. The ex-service man has got a job, and it is a job that he will like.

"There is no secret in finding jobs for these men," asserts Mr. Miller. "All it takes is a bit of personal contact. When I call top men in from other companies, they are always willing to listen, for they are as hard-pressed for good operators as I am."

Perhaps in this, there is the germ of an idea for personnel managers—a little inter-factory co-operation might just solve many an urgent staff problem.

Postal Staff Problems

AN important job in most undertakings of any size today, is the rebuilding of mailing lists and the companion problem of circularising or getting out bulk mail.

Apart altogether from the post-war difficulties created by material shortages, a fair amount of business friction can be caused by delay. Time-lag in getting information to customers is sometimes solely due to addressing, folding and enveloping, correspondence. It is welcome news then, to hear that a British manufacturer has been getting ahead with the production of a machine capable of folding correspondence, stacking it, inserting it into an envelope and finally sealing and franking the package.

At a conservative estimate, this machine can single-fold or double-fold, insert and seal about 5,000 envelopes an hour. BUSINESS should be in a position to give a pretty fair report at a very early date on this machine as we understand our own organisation is shortly putting one into use.

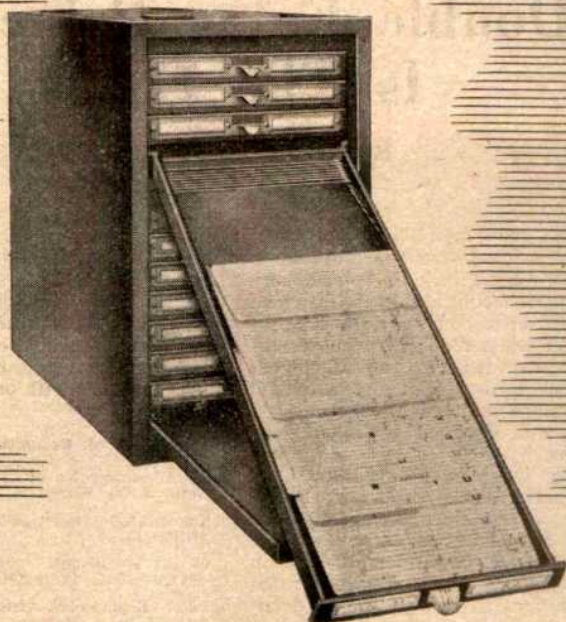
Gradually Better Letters

HERE is an idea for fostering letter improvement in any organisation. When an executive receives his day's mail for signature, he can request that one extra carbon copy be attached to every letter. After signing his mail, he pencils corrections and suggestions on the carbon and hands them back to his typist to file, with a six months' call-up date.

About six months later, he calls for the file and checks the copies with current correspondence to determine whether suggestions have been followed. It isn't the way to correct fundamental errors, but it is a fair approach to the solution of the irritating, petty mistake problem.

It also reveals whether or not the typist is interested in her work. If she is, it seems it can be assumed that from time to time, she browses over the six-months file, in any spare moments she may have.

Multum in Parvo



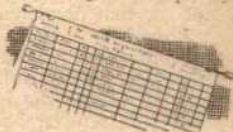
"MUCH IN LITTLE" is an apt description of POSTINDEX. A concentration in one place of all vitally important facts on Purchases—Inventory—Production—Personnel, etc. "At your finger tips" is a literal description of the action of POSTINDEX. A flick of the fingers opens up a complete record of the subject required.



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Filing Gets The Blame

Double Entry Principle Is The Check

By G. H. MARKHAM
G.E.C. Ltd., Coventry

MANY books have been written on filing—an art in itself—but there seems to the exhaustive reader a lack of helpful suggestion for filing of technical data, with which this article proposes to confine itself. The instant production when required, whether tomorrow or ten years hence, of any document need present no serious difficulty provided careful workers are employed conscientiously carrying out a well designed system of routine instructions.

We must for space pass over alphabetic arrangements such as are used for correspondence, each correspondent being allocated a position and all relative matters placed in that position—generally a folder for ease in abstraction. A problem, however, arises when an executive desires to refer to some document of which he has only the subject in his mind.

Then follows endless search, all the available staff being mobilised. The files are ransacked to find something answering to the description, effort is duplicated in desperation, working against time, a harassed band of searchers at best, the same drawer or folder being searched by two or three persons at different times. Every office knows this at times and this is where alphabetic systems pure and simple fail. "Take the total wages of those engaged in your search, Mr. Executive; that document may have cost you £5 or £10 to find. It is doubtless worth that to you, but need you have paid that price?"

The recriminations fall on the filing. They always do. Hence the importance of an unalphabetic or semi-alphabetic system.

The logic of the position is that if you want to refer to a document by subject you must file by subject, or at least a cross-reference, which, in some cases, is a valuable collateral.

That brings us to our theme of filing by subject, or, at least, a subject index for papers other than correspondence by post for which alphabetic files suffice.

The essence of such a system is what in bookkeeping is called "double entry." It is little more trouble to have an extra copy for filing made when typewriting or blue-printing some document, therefore make as the backbone of your system that there are two copies of what you want in your records.

Nor is this merely to double your chances of finding it. Every document must bear on

the top right hand corner or other convenient place, a designation of the file to which it belongs and also the file where its counterpart belongs. This carries the double entry principle a step further.

If it is carefully considered every document you have might have two homes. To make this clear with brevity examples perhaps are best:

Description of Document.	Files (2)
1. L.C.C.—Inspection of Lambeth Water Works.	(a) L.C.C. (b) Works visits.
2. Chromium — Investigation of Patents.	(a) Works Processes. (b) Patents.
3. Wages — Dispute with charge hands in foundry.	(a) Labour negotiations. (b) Foundry.
4. Sales—Report of S. African trip of Sales Manager.	(a) Export Sales. (b) S. Africa.
5. Lighting — Complaint in General Office.	(a) Welfare. (b) Staff negotiations.
6. Advertising — Report of Consultants (A.B. & Co.).	(a) A.B. & Co. (b) Adv. appropriations.
7. Dispute over Trade Marks Act with "X.Y.Z."	(a) Trade Marks. (b) X.Y.Z.

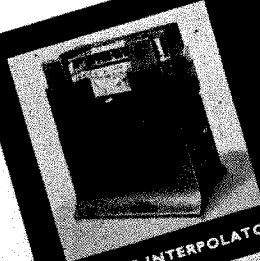
And so the list might be enlarged, but the above examples will suffice. Two copies of the first item on the list will be filed therefore; one in "L.C.C." file and one in "Works visits." If a second copy of any document is wanted you have it immediately; i.e., its counterpart in the opposite folder mentioned.

Thus far the matter presents no difficulty; if second copies have in error not been made quite cheap labour and a typewriter will remedy the matter, but this seldom occurs for every typist at the commencement is reminded of the necessity of two file copies when she has to put two file titles in the top right hand corner.

Any difficulty or delay with incoming documents is met with one or other of the photostat processes which safety in wartime brought into prominence to make instant copies for dispersal. Examples 6 and 7 present this possibility, because you cannot always be sure that people will send you *their* data for filing in duplicate.

For simplicity, ease and speed, with the added assurance of accuracy without checking the photo copy method is strongly recommended. The alternative is to make a precis. It may be a good precis but business men do not act with confidence on a precis; they pre-

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for a word-for-word copy. Some systems are content that the original incoming document is always filed with the first-mentioned file title; e.g., Example 6—the original report of A. B. & Co. is filed in "A. B. & Co." folder, a reference to it and duplicates of any memoranda of discussion or Board Meeting decisions and correspondence will also be found in "Adv. Appropriations."

It will obviously be more convenient to have the whole story (including the report itself) if you secure the "Adv. Appropriations" file. The alternative causes the "A. B. & Co." file to be sent for to see the report in detail. Hence the advisability of having incoming documents copied, including signatures.

The abuse of mere mention by cross reference is a thing to be avoided as a general rule: that every file should be a complete entity should be aimed at. Delay, if nothing worse, is otherwise inevitable; but sometimes tempers as well as time are lost by lack of adherence to best methods, and if many documents have to be referred to you may have

as many titles to spread out which is inconvenient.

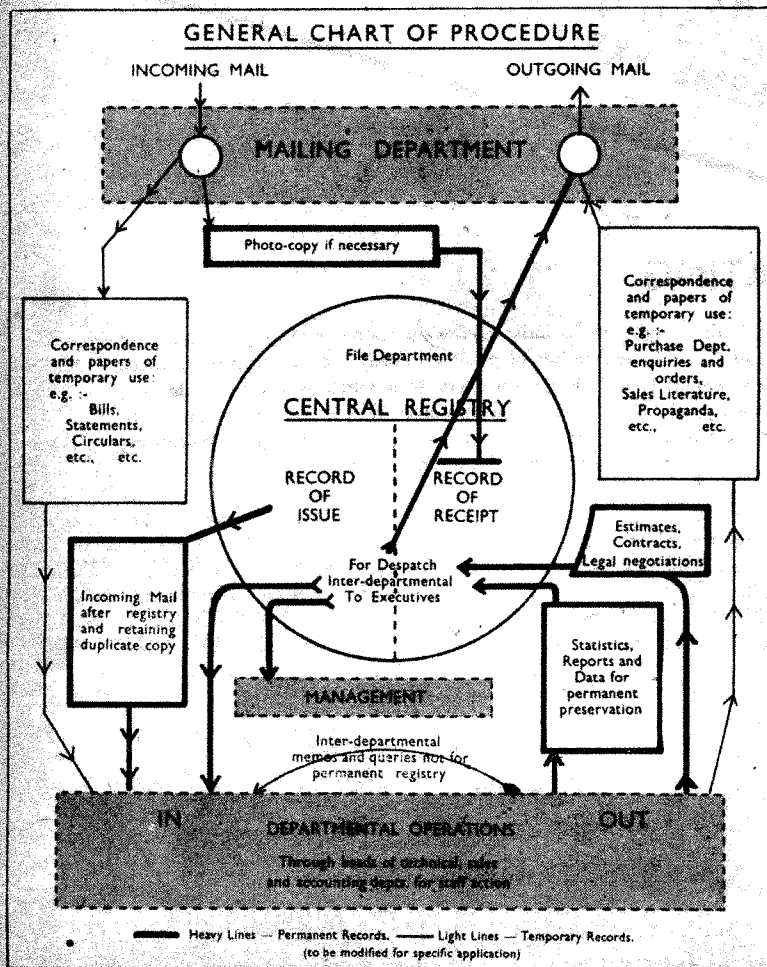
Now we have a complete system applicable to any business, and one which conscientiously carried out provides as nearly an infallible scheme of record keeping as frail humanity is likely to enjoy.

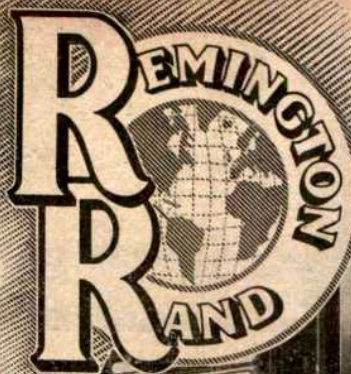
Some of my readers will exclaim—"But to duplicate everything I shall have to double my file capacity." This is not so, but, if it were, far from condemning the system or making any apology for it it is an asset you may not have had. You can abstract a document you wish to take on a trip without leaving your staff without a copy at all; if you want a copy at once you can take it, giving instructions it is to be replaced subsequently to your departure from the duplicate copy remaining.

Another manner of looking at this supposed obstacle is that a nest of filing drawers costs less than your costly searches. Applying the "double entry" analogy again, have you ever suggested to your accountant your system could be equally well kept with half the present records?

Before leaving this side of the matter we are only concerned in this article with data which is a permanent asset to the firm and should be retained as long as the firm stands. It must not be assumed that all incoming mail has to be copied. Most of it is correspondence—some suitable for retention one year, some five years—the items received daily in your post which you wish filed as a permanent asset are few. Count them in your morning mail.

It might be asked, "When shall a document be copied?" Two considerations come up in actual practice: (1) Delay—time is so precious, data should be acted on at once when received; (2) Cir-





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Why Sell the Piece Goods?

Dresses

Bring \$'s

By C. BRYANT

B RITISH fashions are being "sold" to the world in the biggest-ever export drive to be undertaken by this country, but only a fraction of the goods on order are being delivered.

In the past few months wholesale fashion houses all over this country have flung themselves into a united effort to capture the world's markets for British fashions. They have re-established dozens of pre-war markets and have opened up as many new ones. Overseas buyers are streaming into London showrooms eager to buy. Never has there been such an opportunity. Never has the fashion trade been more eager to line up and play its part in increasing British exports by the all-round seventy-five per cent. above pre-war level which has been fixed as the national target. And never has the world been so willing and even anxious to buy British as in this sphere.

But in the showrooms and workrooms of the West End manufacturers to-day the tide of prosperity and hope is not flowing as it should. The goods are not going out. Managerial desks are heaped high with export licences that cannot be completed because the goods are not forthcoming. Correspondence files are heavy with Government Department letters whose tenor is delay and evasion. Suppliers of fabrics write in terms of regret and perpetual postponement. Overseas buyers, the securing of whose orders seemed so very well worth-while to our fashion trade at the beginning of the export drive, are now

starting to send in cancellations of goods ordered because of late deliveries. France, America and other countries who are also interested in selling their fashions to the world are being allowed to beat us to the winning post.

The authoritative view of the trade is that unless the whole situation is cleared up forthwith British fashions will have missed the overseas boat. A first-rate chance of expanding the fashion trade abroad on a scale never before attempted or achieved will be lost. An industry whose products have immense prestige value for this country overseas, and which offer a wide range of employment, skilled and unskilled, technical, commercial and artistic, will have been stifled by lack of initiative.

Meantime employers are finding it hard to provide full employment for highly skilled workers, freed from war jobs and able and eager to return to their own trade.

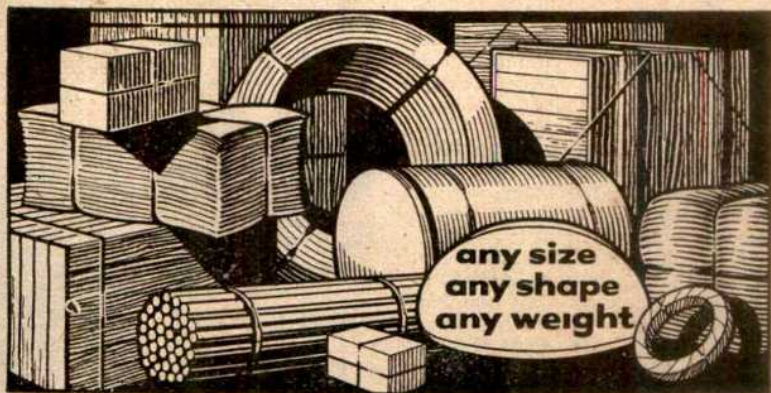
Where does the fault chiefly lie? Where is the bottleneck?

The models exist and have been shown to buyers at a number of big and impressive displays. They have won the highest approval and have been snatched up. But when the orders start pouring in our wholesale fashion houses cannot get the necessary materials with which to meet them and produce the goods on a large scale.

"We are back to the position which faced us when we first started business twenty-five years ago," said the head of one famous house. "We have to search and struggle for fabrics, to buy a piece here and a piece there in a kind of desperate treasure hunt. The acquisition of half a piece of material—enough for about half a dozen made-up garments—is regarded as a major triumph."

A substantial supply of materials does, however, exist, in far better quantities than is suggested by this picture. There is in particular a very good quantity of woollen fab-

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rics available now, although rayons and silks are not so abundant. Cloth that was diverted to Government Departments during the war is back in ordinary circulation again. But it is not going to the made-up trade. Up to sixty per cent. of the whole production of wool and rayon—the materials in greatest demand by the fashion trade—is being exported in the piece. In spite of the demand of the fashion houses it is continuing to do so. The manufacturers have been encouraged in this by the Board of Trade, and there is no profit control on exported piece goods, or for that matter, on exported made-up goods, while there is a profit control on piece goods sold in this country to the makers-up. In other words, it naturally pays the wool or rayon manufacturer to export in the piece.

As an indication that this is happening, exports of woven piece goods made of cotton valued £2,663,418 monthly in 1938 and £3,333,491 in January, 1946, while the corresponding figures for wool were £471,982 monthly in 1938 and £661,273 in January, 1946. So far as rayon is concerned, silk and artificial silk yarns and manufactures were exported to the monthly average of £458,513 in 1938, and in January, 1946 the figure had soared to £1,787,838.

While it cannot be assumed that all these represent fabric for wear, the figures are surely significant. What is noticeable too, though not perhaps wholly relevant to the present issue, is that in every case, although

IF BRITAIN CAN MAKE IT

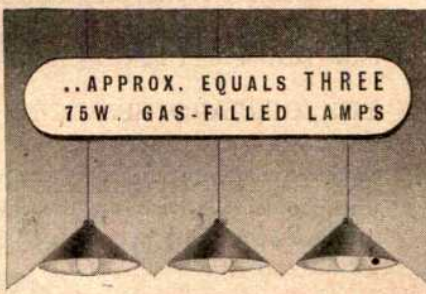


WHY SELL OUR RAW MATERIAL?

the value is higher today than in 1938, the yardage is always substantially lower.

The question whether this raising of prices is a sound long-term export policy seems to call for consideration.

It must be recognised that the overseas



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Chad reacts only to the things that should be here, but are not. About the things that should be here and, in fact, *are*, he makes no comment. He takes them for granted, as do we all. Chad, therefore, is mute on the subject of Electricity; it is not within his province.

'Wot!... No Electricity?'

One could doubtless chad quite easily on certain aspects of its vast and varied service. But Electricity as an efficient, progressive institution... well, when you flip the light-switch in your office, when you click on the electric fire in your home, *something happens*—instantly! If it did not, then we should see chadding indeed.

It may be said that once one understands the principles of Electricity the rest is just a matter of generating, wiring, and good organisation on an immense scale. But if all this did not progressively get better and better, then Mr. Chad, and his human counterparts, would inevitably, immediately, and vociferously want to know, 'Wot about it?' The point is that it *does* progressively get better and better.

'Well, the war's over now'

Yes, it's peace-time... So look a little harder over that wall of yours, Mr. Chad. Already many home appliances are appearing in the shops. Mrs. Chad will tell you that she now has her electric kettle, that soon her name will come up on the list for your new refrigerator. She knows that (things being what they are) she must go easy on the electric fire, but she also knows that she *can* switch on and get heat... just like that! You know that the pylon-held cables continue to bring more and more of this strange, taken-for-granted commodity called Electricity, that the master-switch in the biscuit works, works! That fluorescent lighting is appearing in offices and factories everywhere, that something is being done, and always will be done, about electrical improvement.

... It's just a thought, Mr. Chad... and if you are thinking about the statement displayed in the other part of this page, do not regard it, please, as just a slogan... it is a *fact*!

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ELECTRICITY

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counter trade is an important one and that it must not be prejudiced. Unless, it is held and maintained it may be lost to competitive countries. But a modest ten or fifteen per cent. out of that 60 per cent. now sent for export in the piece would supply the essential needs of the maker-up for export. The last thing the latter wants is that the prices of fabrics sold to him for the made-up export trade should be price-controlled. He is willing to pay as much as the manufacturer receives when he exports in the piece. He would much prefer an arrangement whereby, if the manufacturer is selling fabrics against export licences for made-up goods, such purchases should be at decontrolled prices.

Get 12 Guineas not 3

"A length of cloth costing, say, £3 makes up into a garment worth ten or twelve guineas in the export market," said Mr. H. Scott, Chairman of the Guild of British Creative Designers. "It is therefore greatly to the advantage of the nation's trade balance that we should export fashions in preference to piece goods and nothing else. In addition, British labour is employed and British design enjoys the stimulus of competition and prestige in the world's markets.

"From the fabric manufacturer's point of view, moreover," he continued, "the made-up garment is the best advertisement for his products overseas, because the full beauty

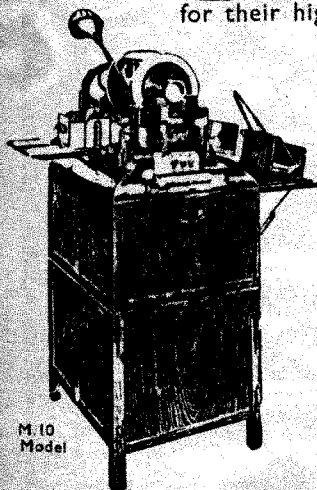
of a material is seen only when it is used for the purpose it is intended. The price the maker-up pays for his materials is not a vital factor in the case of quality goods such as those we export. Between the controlled price at home and the uncontrolled price charged overseas there is usually only the difference of a few shillings. The real cost is in the design and production of the finished garment."

Wool presents the greatest difficulties, and the forms sent out by the Wool Control are one of the made-up trade's biggest headaches. Under the Wool Control's "PRA" scheme a quota of woollen material is allocated for goods made for export. To obtain it returns have to be made of the value of goods invoiced for export during the twelve months ending 31st December, 1945, of the total wool fabric weight of such goods and the weight of wool-hair interlinings included.

"During that period," said a member of the made-up trade, "exports were almost nil. For half of the time the European war was still being fought, and during the latter six months it was next to impossible to obtain supplies of materials or to get licences to export them. New allocations which amount to a percentage of last year's are therefore ludicrous, and to make them the basis of a trade now clamouring for expansion shows a paralysing lack of imagination and of common-sense. So far as calculations of wool weight are concerned, that is a matter

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quite outside the sphere of the maker-up. To crown all, the final result, if the form is filled up, is that about a third of last year's quota may possibly be granted."

That the Wool Control is completely lacking in understanding of the present-day position is the general view of the fashion export trade.

If it is beyond the capacity of British industry to supply the fashion trade with all the fabrics it needs, other supplies are available, and it would seem that there is a case for their being utilised, at any rate during the present emergency. A step has been taken in this direction recently, when permission was given for French rayons to be imported into Britain—but note the rather familiar sinister condition "as and when arrangements can be made between the Government departments concerned."

Their Efforts Kept Name Alive

Why, asks the maker-up should not these and other imported materials be used to augment the supply of made-up garments for export? Switzerland, for instance, is in a position to sell us textiles, and the final trade balance would be in our favour if these were used for sending overseas made-up garments worth many times the value of the cloth used. Switzerland is already selling such dress materials to Eire, Portugal, Spain and other countries against export licences.

In the middle of the war, when fashions

seemed dead and export markets were almost non-existent, Mr. Scott, in conjunction with eleven other enthusiasts in the trade, all of them heads of wholesale model houses, formed an informal luncheon club at which they met and discussed their problems. By that means they aimed at keeping the creative side of fashion alive in a world that had put on battle dress in spirit if not always in actual fact, and had had its sense of style and design dulled down to the inevitable utility standards.

This effort grew into the Guild of British Creative Designers which is now expanding to constitute a body representative of the wholesale side of creative fashion. It is devoted to propaganda and trade promotion. It held its first big fashion show in June, 1945, when it had the gratification of seeing the entire collection taken up *en bloc* by Myers of Melbourne and David Jones of Sydney, and exported to Australia where it had an immense success. It is now preparing further shows.

There is, according to Mr. Scott, a clear and well-defined field for British enterprise in the world fashion market, and a field capable of immense expansion. It is a field where Britain has her place on as important a scale as Paris or the U.S.A. and where her progress in the immediate future would not entail cut-throat competition with either of these.

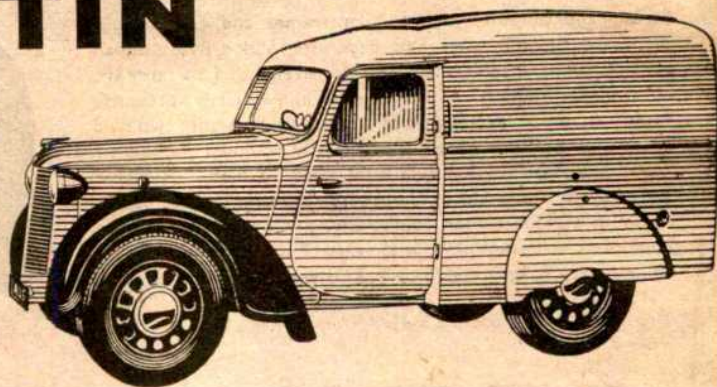
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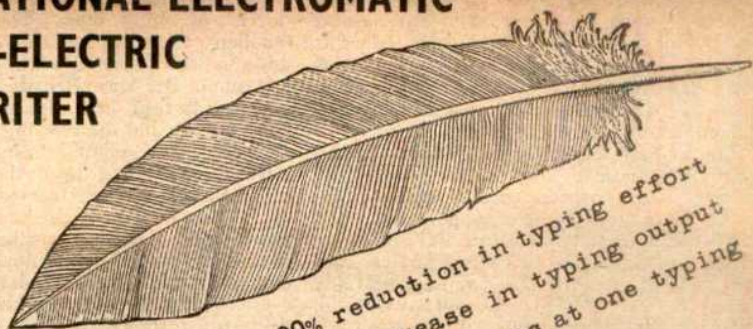
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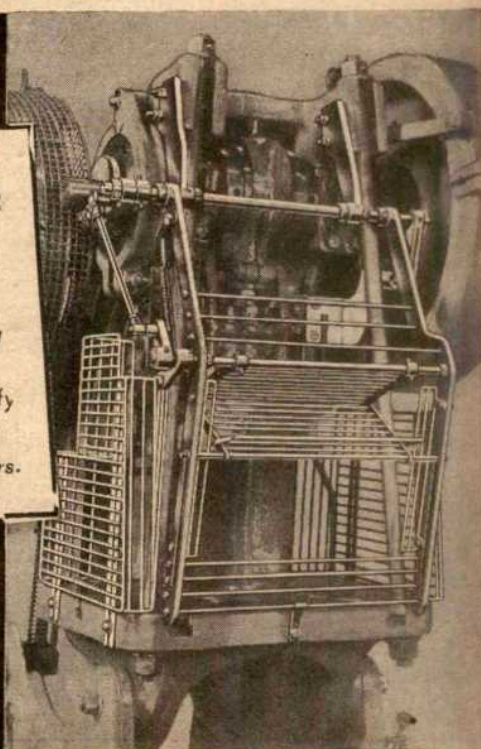
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houses," explained Mr. Scott. "She exports her original models, which are treated and priced somewhat like works of art and which are sold as such, to be copied in other countries by the firm which buys them for this purpose. The U.S.A., in turn, concentrates upon mass-produced goods, in the styling and sizing of which she has reached an unequalled level of proficiency.

"For Britain there remains an undisputed field in wholesale *couture* dress-making and tailoring. Our position here is unique. We should seize the present opportunity and secure the markets that await us."

Strong testimony to this effect has recently been brought back to this country by Lady Wakefield, wife of Sir Wavell Wakefield, M.P. for St. Marylebone, the district of London in which most of the big wholesale dressmaking firms have their showrooms.

Only too Anxious to Buy

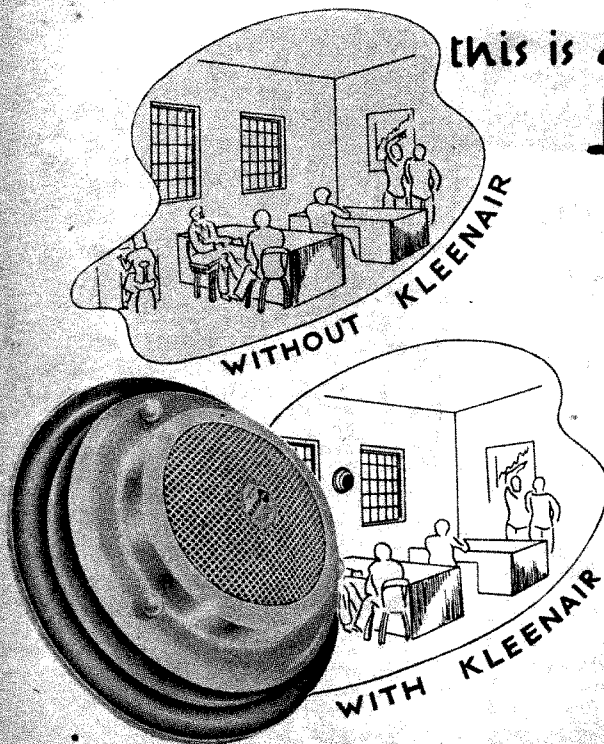
With the support of the Board of Trade, and on behalf of the Guild of British Creative Designers, Lady Wakefield went out early this year as an ambassador of British fashion to Egypt, Rhodesia and South Africa. Her purpose was to make the countries she visited more conscious of the quality and style of British designs, and to bring back first-hand knowledge of the special needs of these overseas markets.

"Everywhere I went," Lady Wakefield said in an interview with *BUSINESS*, "I found the

greatest enthusiasm for British fashions. From the original designs and sketches which I took with me I could have sold each model dozens of times over. The quality of the woollens were particularly admired and the designs were greeted with the warmest admiration. Pre-war British fashions, I was, afterwards told, had been regarded as somewhat dowdy, but the new ones were welcomed as being the height of smartness, full of interest and really up-to-date.

"It was, however, stressed to me time and again that deliveries must not be long delayed. The markets are ripe and clamouring for goods, and if we do not get our fashions overseas quickly competitors will step in and establish themselves. In Cairo and Alexandria, for instance, there is an immense demand for smart clothes, and evidently no limit to the price women will pay for them. We should strike while the iron is hot and not miss the opportunity. The French are already getting busy there, and are sending over many models. During my visit two fashion shows were held in Cairo of entirely French models from the well-known fashion houses of Paris. So we must get busy.

"All this," Lady Wakefield explained, "illustrates the eagerness of the Empire to buy British, and the real need for cultivating these markets, making sure that we supply their special needs. They have a feeling of being neglected by us, which the fashion trade can do much to correct if it can tackle the export problem immediately."



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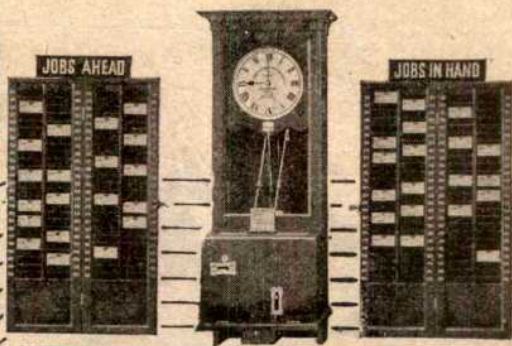
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THE people who take care and help solve your problems in mechanical handling are on their toes. One of their first post-war efforts is to launch one of the smallest and most compact industrial tractors yet manufactured. It incorporates many features that show marked advances in the design of this class of materials handling equipment.

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Care has not only been given to all practical points to produce a tractor that will stand up to the most arduous duty in the work for which it has been designed, that

is, for the haulage of trailers in factories, railway stations, dockyards, aerodromes and the general towing, pushing and shunting of heavy loads or vehicles; but attention has been given to making all working parts as readily accessible as possible, thus facilitating maintenance.

The overall length, width and height of the tractor is 6 ft. 4½ ins., 3 ft. 10 ins. and 4 ft. 4 ins. respectively, the wheel base is 3 ft. 4 ins. and underclearance 6 inches, the outside turning radius is 80 inches, turning circle diameter 13 ft. 4 ins. and service weight 30 cwt.

Both front and rear wheels are of the divided type, thus making puncture repairing an easy maintenance operation. Pneumatic tyres are fitted as standard—front wheels 18 in. by 7 in. and rear 23 in. by 7 in. Over-size wheels and tyres may be fitted to special order, these sizes being front 23 in. by 5 in., rear 25 in. by 6 in. Both standard and over-



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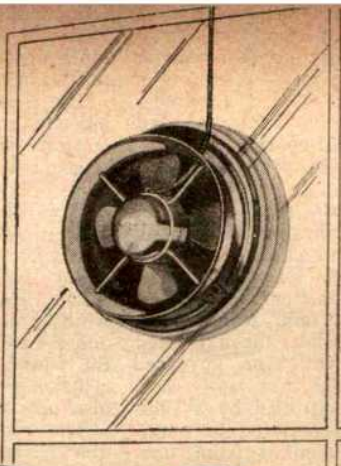
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The power unit is a 12/24 H.P. 4 cylinder petrol engine, developing 20 b.h.p. at 1,600 r.p.m., a maximum b.h.p. of 26 at 2,400 r.p.m., and a maximum torque of 792 lbs. ins. at 1,400 r.p.m.

The engine unit is suspended on rubber mountings which absorb vibration and protect it from shocks when travelling on rough ground or pushing heavy loads. A single plate clutch of large diameter and a compact gearbox complete the unit. Road speeds of $\frac{1}{2}$ to 10 m.p.h. are possible, the top speed varying in accordance with the governed maximum engine speed.

The engine speed is controlled by a velocity type governor which permits the maximum speed to be controlled at from 1,400 to 2,000 r.p.m., the governor being set and sealed for 1,600 r.p.m. maximum engine speed on all standard tractors, with an idling speed of 300 r.p.m.

Because of its design, when greater accessibility is desired, the bonnet may easily be detached from the hinge and laid on one side, while the bonnet sides can be removed by undoing three nuts and bolts, rendering the engine accessible for purposes of decarbonising and major overhaul. Further maintenance assistance is given by the en-

gine being easily removed from the chassis by means of a lifting eye-bolt fitted to the top of the engine, facilitating movement and preventing damage by slings.

The tractor is provided with electric lighting equipment to permit working after dark on intra-plant materials movement and the occasional transport of materials on the public highway.

The robust design of the chassis is evident in these pictures. It is an all-welded construction job, entirely fabricated from heavy steel sections by arc-welding process.

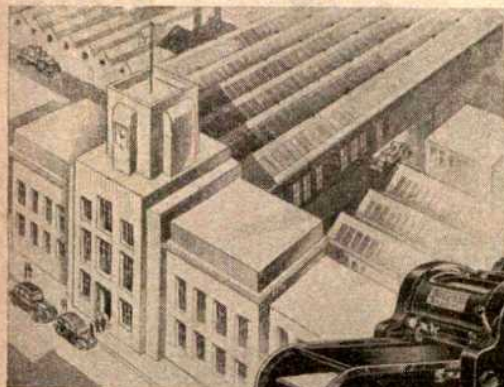
The heavily braced front bumper plate, which completely protects the front wheels and the radiator guard, is made integral with the frame. The driver is fully protected by a heavily braced rear bumper plate which also acts as a rear wheel guard.

The rear towing bracket, fitted with a quickly removable towing pin with safety device, is bolted to the frame. The floor plates and mudguards are fabricated from $\frac{1}{2}$ in. thick steel trade plate.

The slinging hooks shown recessed in the front and rear mudguards are spring loaded to prevent rattle, but are welded to give strength, therefore they should not call for service at any time. By these means the tractor may be lifted by crane on and off boats or from quays into any floor of a warehouse.

It should also be noted that on account

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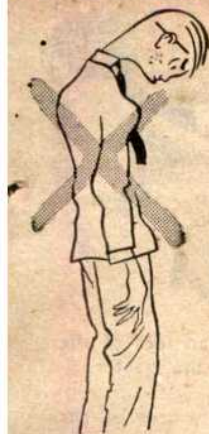
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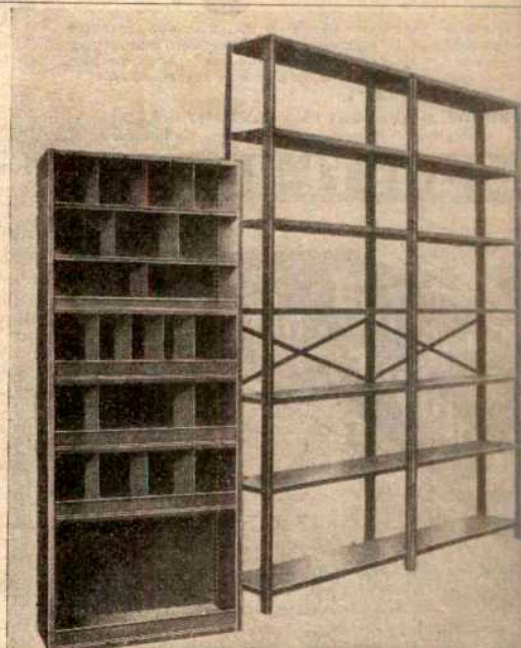
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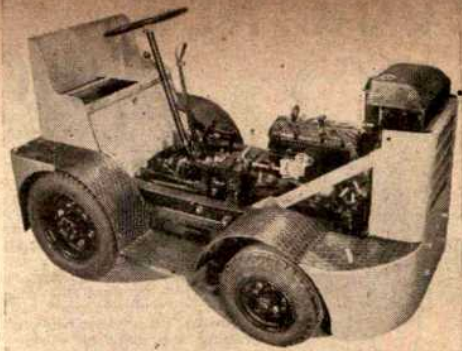
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A fine angle shot giving an idea of the
strength and design of the tractor

of its small size, the tractor can be easily transported in a normal goods lift for work on different floors in the same building.

The rear axle has been specially designed for exceptionally heavy duty; it is fully floating with differential and worm drive, and rigidly mounted on the chassis frame. All rotating components are mounted in ball or taper roller bearings. The front axle is a forged carbon steel beam fitted with two semi-elliptical springs connected to the frame by hardened shackles pins. The adoption of large area seating pads and an extra damping leaf are special features of the springing arrangement.

Transmission is through the specially designed double universal coupling, which permits the transmission of power to the rear axle without vibration, noise or backlash. All articulation and axila displacement is taken up by the resilient rubber trunnion blocks. A feature of this transmission is that it requires no lubrication and has an extremely long life.

The brakes are Girling mechanical type, internally expanding, giving a very positive and easy action by foot pedal, in 10 inch diameter drums. A hand brake has been provided for parking purposes. The brake cross-shaft moves in self-lubricating bushes and all fork end pins are spring loaded.

Normally the brakes are very easily taken up by turning a square headed adjusting screw on the rear of the brake-drums one or two notches as required. Further adjustment may be effected when necessary by extracting the pin fixing the yoke or clevis to the brake cross-shaft arm, turning the clevis on the thread, and re-fixing to the arm.

For major overhauls, the ballast weight can be lifted from the frame by means of a hoist, the hook of which can be attached through the centre hole shown to the extreme right centre of the picture.

Care has been given to driving comfort, for the driver has been provided with a rubber padded seat having a comfortable back rest, with all controls within easy reach.

It will be observed that the instrument panel is equipped with choke control, am-

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meter, horn push button, oil pressure gauge, ignition switch, starter switch and combined lighting and charging switch.

In the event of a failure of any of the electrical instruments, the instrument panel can be removed from the dash-board and drawn forward after undoing two fixing screws, there being ample length of leads allowed for this to be carried out without any difficulty.

The petrol pipe from the petrol tank reserve tap is of the high quality flexible type, and can be easily and rapidly replaced should it be necessary. The steering box is filled with lubricant externally from a filler hole at about foot-pedal height at the front of the steering column.

The lighting equipment is fitted as a standard and consists of combined side and head lamps with the tail lamp recessed in the bumper plate, while the complete electrical wiring circuit is embodied in a harness specially protected at all vulnerable points.

The usual noise and fumes nuisance is practically eliminated by a silencer which reduces back pressure and fumes to a minimum.

The designers of this tractor have given much care and forethought to the production of a clean-lined vehicle of attractive finish—all surfaces being prepared with rust-resisting treatment and the exterior cellulose-sprayed and polished in an attractive colour combination of royal scarlet, with black wheels, mudguards and floor-plate; but accessibility has not been sacrificed for appearance.

Here, then, is a tractor which represents an example of handling equipment whereby appearance and practical essentials are happily combined. It is designed to suit the job to which it is applied, that is for easy manoeuvrability within the smallest space and to handle heavy loads. This is evident from the facts that the minimum intersecting aisles is 5 ft. 4 ins. and maximum drawbar pull is 2,500 lbs.

In addition, ease of maintenance and routine servicing has not been neglected, even to the extent of fitting a routine service tool locker located in a handy position next to the driver's seat, with a servicing instruction plate fixed above the tool box as a constant reminder of routine servicing necessary.

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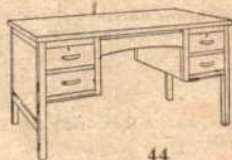
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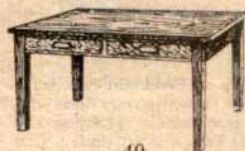
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Continued from page 63

must be imported on a large scale, and this will send up the adverse trade balance long before exports can benefit from the imports. It may also result in diversion of some trade to the U.S.A. Once the dollars are available some of our sterling liabilities will have to be met, and trade is circular not bilateral. But business men crying aloud for raw materials should not imagine that immediately the loan is through their troubles will be over.

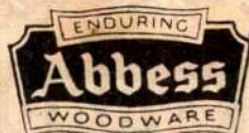
Unfortunately, the loan is the bare minimum necessary to restore our economy to health, and strict control over the expenditure of the dollars and their allocation in accordance with priority of need will continue. Further, the total credit has to last for five years; it will be eked out by the Chancellor.

Empire trade is to be protected still. The prolonged loan discussions in Congress have had that desirable result. There has been time for second thoughts, and the postponement of the International Trade Conference is the result.

The international trade proposals, which were published as accepted in principle by Britain and U.S.A. alike, will not now be implemented. The Dominions have proved that they went too far and that Empire preference, though possibly modified, must stay. Justification for this reversal of agreed policy is that the debates in the U.S. Senate have shown there is no likelihood of a general and effective reduction in American tariffs; and that was the *quid pro quo* for the abolition of preference.

Ultimately there will be an international trade conference, but the published proposals may not even constitute the agenda. They are dead.

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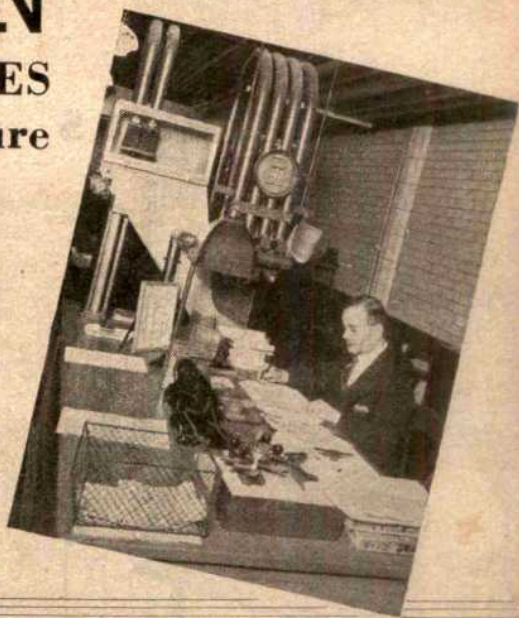
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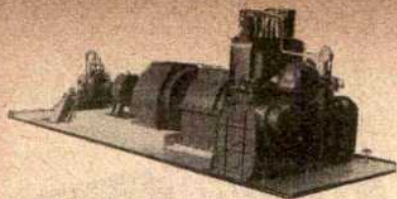
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LITTLEWOODS SET-UP

Continued from page 45

dinghies were next put into production.

A greater test came when the firm was chosen as the first non-engineering one to be put on fuses and Oerlikon shells. Later on, U.S. industrial experts were sent to see how free labour had been diverted to engineering, and especially how shop-girls had become machine tool setters. Later, Pools girls were a notable success at making Wellington aircraft frames. It all proved again that time study, drive and co-operation could overcome all obstacles.

To-day at fifty, John Moores is consolidating his three businesses.

"Don't let the shoots come out and weaken the tree," he says. With increasing production he hopes to restore mail order and stores to pre-war capacity and more. But he himself is relaxing a little. He works eight or nine hours a day instead of fourteen. His golf is getting better and his handicap is down to four. He is just off for a walking holiday from Cannes to Marseilles, retracing the route he took in the spring of 1940.

With him he has his daily notes of that journey—a systematic record of roads, distances, hotels, so that in his favourite relaxation as in his work he can learn by experience, and get things down on paper.

He had a serious illness last year, and that warned him that it wouldn't do for him to hold such complete control of everything that it would go to pieces without him. He has put in the system. He knows it from A to Z. So now he can, up to a point, forget it and delegate it.

But his electric energy, his closeness to the ordinary man, his zest, are qualities that will go on seeking an outlet. It won't, one feels, be long before he is working out something else with paper and pencil.

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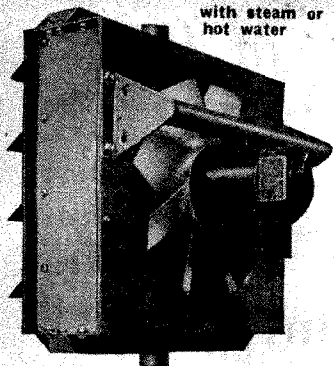
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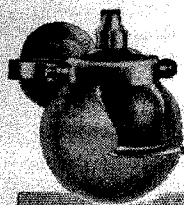
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Health- in Industry.

We CAN Rid Our Factories from the Scourge of Industrial Cancer

By Dr. A. N. CURRIE
M.A., D.Sc., M.B., Ch.B., A.R.I.C.

THE disease of cancer—as old as man—must have exercised his mind almost from the beginning of human existence. Much thought has been expended on the problem during the last 100 years, but although some knowledge has been gained concerning cellular metabolism, it is doubtful if we have at present any real knowledge of the factors controlling cell division.

The ordinary cells of the body grow under an unknown control until a definite tissue pattern is achieved; the malignant cell goes on dividing from strength to strength giving rise to millions of daughter cells with no apparent diminution in the intracellular factor which perpetuates this division. The intracellular factor may be present at all times, and may be brought into action by the presence of an external stimulant of a specific type.

There seems to be very little doubt that such industrial contacts as soot, pitch, tar, aniline derivatives, arsenic, X-rays and radioactive substances provide stimulants to cell division as shown by the high incidence of cancer in trades associated with their use.

The commonest industrial cancers are: (1) Cancer of the skin, associated with contact with soot, tar, pitch, bitumen, shale oil, arsenic, X-rays and radioactive bodies; (2) Cancer of the bladder associated with aniline and its derivatives; (3) Cancer of the lung associated with arsenic, cobalt mining, chrome. A rare type of cancer is that of the ethmoid and related bones associated with nickel refining.

(1) Cancer of the Skin.

The incidence of skin cancer especially of the scrotum in chimney sweeps was very high in this country over 150 years ago when the

common and reprehensible practice, happily abandoned in the early 19th Century, was to send young boys into chimneys to sweep out soot. These poor young people, very often apprenticed to the trade at the tender age of six years, worked long hours, and slept on sacking saturated with soot. There was no leisure nor time for games, and the youngsters passed a miserable existence in this dreary atmosphere until death came as a merciful relief or emancipation was obtained by a change of occupation.

It is not surprising to learn that cases of skin cancer occurred in children under eight years of age. One such case was recorded by Sir James Earle at St. Bartholomew's Hospital in 1808. Cancer is usually a disease of middle age, but given the optimum conditions for cell proliferation, such as prolonged tissue irritation and the appropriate carcinogenic substance, it may occur at almost any level of existence.

Although gas works were established about the year 1810, it was not until 1856 that the value of waste gas works tar was realised, and tar distilleries sprang up in different parts of the country. In 1859 the manufacture of patent fuel (briquettes) containing crushed coal and pitch commenced in South Wales. The first by-product coke-oven plant was laid down in County Durham in 1882 introducing a tar and pitch risk.

In all these processes there is considerable unavoidable handling of tar, and susceptible workers after a year or two develop chronic dermatitis and typical warty growths of the skin especially about the face, neck, arms and scrotum. After a lapse of perhaps 15 to 20 years a wart may ulcerate and develop into a malignant growth.

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If this is excised at an early stage there is little likelihood of a recurrence on the site, although independent warts elsewhere on the body may fulminate and become malignant. Prompt surgical intervention effects a cure since in the early period of malignancy there is no tendency towards the production of secondary deposits in other parts of the body.

At coke-ovens, the residual pitch is allowed to run into bays where it solidifies. From time to time coke-oven workers are employed as pitch getters digging out this pitch with pick and shovel and loading it onto transport vehicles. In the summer season this is uncomfortable work as the pitch dust flies considerably and deposits on the workers' faces causing smarting and lachrymation. The pores of the face and neck become plugged with minute particles of pitch which produce an acne-like or blackhead effect. The men complain of difficulty in shaving owing to the tenderness of the skin. They usually protect the eyes during work by means of a gauze veil, and the skin of the face by plastering it with a cream made from water and Fuller's earth.

Many of these workers develop warty growths which assume malignancy after the lapse of 15-20 years. Periodic medical examination twice yearly is on a voluntary basis, and this provision is taken advantage of by most workers, but some delay seeking advice until it is too late, especially when they suffer from cancer of the privates.

Cases of ulceration occur among wharfingers and road tarrers who handle tar and pitch on a large and continuous scale, and briquette makers also occupy a high place in the list of affected persons. Other users of pitch are corkstone workers, who make slabs from a mixture of cork and pitch, and electrode makers in aluminium works where the large block electrodes consist of a mixture of graphite and pitch. The population at risk is naturally small in these industries, but nevertheless malignant epitheliomatous ulceration occurs in workers from time to time.

Apart from close contact with tar in distilleries there is a dispersed contact in a diversity of occupations such as tarring of roads, buildings, boats, tarring of brattice cloth for use in mines ventilation, tarring of sacks and the tarring of fishing nets. In the last process coal tar is generally used, but in some instances Archangel or Stockholm tar derived by the destructive distillation of wood is the medium used.

It is said that wood tar is innocuous, but it is difficult to assess its culpability, if any, because wood and coal tar are both used in net fixing yards and the operator is liable to a mixed exposure to liquid or fume from each. Net fixers generally suffer from new growths on face, neck and hands and arms.

Shale oil is in a different category from tar.

Oil Shale which is found below the lower coal measures in the West and Mid Lothian districts and under the Firth of Forth is mined in the same manner as coal. After

breaking in special machines it is fed into large vertical retorts where the temperature is maintained at 1600°F. in the lower portion and 900°F. in the upper portion of the plant. Oil gases are distilled off at the higher temperature, and ammonia at the lower. The latter is converted subsequently into ammonia sulphate used for fertiliser purposes.

The oil gases are condensed, and the resultant crude oil is distilled to dryness leaving a residual shale coke. The crude distillate is mixed with sulphuric acid, then with caustic soda to remove tarry matters, and the heavy oil left is known as "Green Oil."

This oil comes into contact with the skin at the next stage of filter pressing when a semi-solid paraffin scale used for making candles is left on the filters. The expressed oil is now known as "Blue Oil." The workers' arms are exposed to this oil due to drippage from paraffin scale as it is being trayed above the filters, and the legs and feet get wet from spillage of oil on the floor. Blue oil and lighter fractions subsequently distilled from it were definitely carcinogenic when applied to mice.

In the shale oil area with perhaps 10,000 workers at risk over a period of 20 years from 1900 to 1921 there were 65 cases of paraffin epithelioma. The ages of the cases varied from 37 to 79 years, and the sites of the lesions were principally on the scrotum, and arm, forearm and hands.

Mineral Oil Risks

In 1910 S. R. Wilson, of Manchester, while a resident at the Manchester Royal Infirmary, wrote a report on the occurrence of epitheliomatous ulceration among cotton mule spinners. It was not published at the time, but in 1922 he, with Mr. Southam, drew public attention to the high incidence of this trade condition in Lancashire. It was suggested that the malignant tumours produced principally on the scrotum and thighs were due to the constant bathing of these parts with oil during the process of oiling mule spindles. Friction by the oil-sodden clothes accelerated the process of the condition.

When further inquiry was made into the nature of the lubricant it was found that it was a fraction of a mineral oil obtained during the refining of Scottish shale oil and it is possible that even though workers began to be exposed to this oil much later in England, more cases have arisen in Lancashire than in the place of origin of the oil because of the bigger population at risk.

Dr. S. A. Henry, one-time H.M. Medical Inspector of Factories and an acknowledged authority on industrial cancer, has recently published a monograph on "Cancer of the Scrotum in Relation to Occupation." In his book he analyses 1,631 cases of scrotal cancer arising in England and Wales during the period 1911-1938 and finds the incidence per million highest among chimney sweeps, the figure being 754.7. The next highest group is all employed in patent fuel works where

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the figure is 504.2, and the third highest is the group of cotton mule spinners where the figure is 422.5.

The earliest discovered case of mule spinners cancer in Lancashire appears to have been in 1887 when a spinner died in Manchester of cancer of the glands of the groin following cancer of the scrotum.

A good deal of research work has been carried out in the Manchester area regarding the possibility of substituting innocuous oils and several mechanical devices have been adapted and adopted to minimise splash and spray. It is hoped that further advances towards prevention will culminate successfully in the near future.

Arsenical compounds are used industrially in the manufacture of sheep dips, insecticides, as a preservative of hides, skins and furs, and as a depilatory in tanneries. After a short exposure to these compounds, the skin especially around the nose and mouth, or on moist surfaces such as the armpit develops an acneiform eruption which may lead to an extensive benign ulceration.

After many years' exposure in susceptible persons malignant ulceration may supervene. Arsenic pock is produced on the fingers and toes even after only three or four weeks of contact, and with this condition are associated swelling of the eyelids, sore throat, hoarseness and depression. There may also be gastric symptoms such as vomiting, abdominal cramp and diarrhoea.

Brown pigmentation may be seen on the upper and lower eyelids, on the temples, neck and armpits of those who have worked for many years in an arsenical atmosphere, and in many cases if the nose be examined it is found that the septum is perforated.

Preventive measures include the provision of local exhaust ventilation over dusty processes, the wearing of dust respirators, the provision of adequate protective clothing and washing facilities.

Characteristic burns are produced by exposure to X-rays. They differ from heat burns insofar as there is a considerable period of delay between exposure and the appearance of inflammatory reaction. This latent period may vary from a few hours to several days or perhaps weeks. The burn lasts longer and takes longer to heal, and some cases, instead of healing, tends to develop a chronic ulceration which becomes cancerous.

The trouble should be dealt with by the limitation of working hours and adequate screening of the X-ray source by lead glass, and lead lined partitions and the wearing of leaded rubber gloves. The use of X-rays in industry for detecting blow-holes, fissures and other flaws in castings is increasing.

During the war, there was a marked increase in the use of mesothorium compounds for the painting of aircraft panel dials, etc., to render them luminous. This substance is radioactive and constantly emits the alpha, beta and gamma rays characteristic of radium. In addition a gas—radon—is evolved.

[To be concluded]

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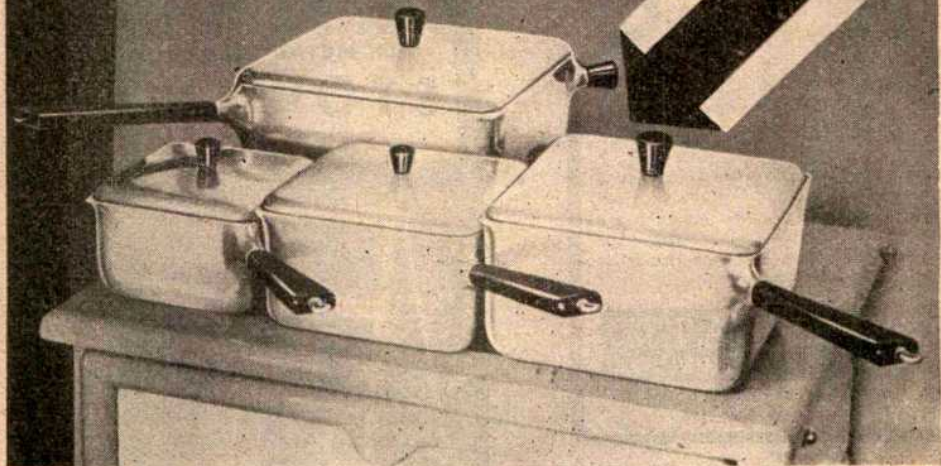
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Talking of PANS...



By "GADGET"

ARTICLES for universal use in kitchens should provide a subject of interest to all, so no excuse is necessary in creating discourse on such an ordinary domestic article as a pan, for there is more in the topic than first meets the eye.

Why are pans almost invariably round in shape? It is highly probable that the reason is provided by the fact that whenever a new material is used in manufacturing a product previously manufactured in some other material, then in order to avoid upsetting the susceptibilities of the public, the old article is often copied as closely as possible.

The old cooking pots, being made from clay, were most easily made in a round shape, and were also stronger and less liable to break. In fact the round shape was obviously the best for earthenware goods. Therefore, one is inclined to the view that the shape of the modern pan is a copy of the old earthenware cooking pots. Personally, I can think of no other reason.

Take the methods of oven cooking. Roasting pans for joints, and pudding dishes, are invariably rectangular in shape owing to the fact that they are intended to fit and be used in the rectangular or square interior of an oven. To use round vessels would obviously be a waste of space, and necessitate the use of an oven of nearly double the size to do the same amount of cooking.

Yet on the restricted space on top of that same range, we use round pans! What a

waste of space and also of fuel—which brings me to the point!

As a result of a test of a new type of pan which is now available, some most interesting information is forthcoming. The pans are square in shape, but acute angles have been eliminated and replaced by curves. The result is that cleaning is easier than with round pans, which of course have an awkward angle where the sides meet the base.

Of heavy cast aluminium, the pans are suitable for gas or electric cooking, and also for any form of "contact" cooking on flat cooking surfaces provided by the well known solid fuel ranges. Made to last a lifetime, perfect heat conductivity is coupled with strength, whilst cracks and dents are impossible. There will never be the need for replacements—this appears to be the only point the manufacturers have overlooked!

The ordinary aluminium pan has the handle attached by means of rivets, a weakness and an additional creation of crevices for the accommodation of food particles. The new pans have a rounded projection incorporated in the pan casting, to form the base of the handle, rivetting being thus obviated.

The handle itself is of a heatproof plastic material, and is very dense and extremely strong, having been shaped under an enormous pressure.

Rectangular in section, the handle is scientifically placed at an angle best suited for

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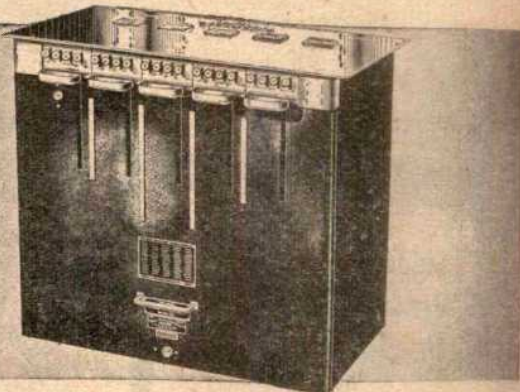
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ance of risk of slip in greasy hands.

An important feature is the double spout or lip for pouring. Lips for this purpose are located at opposite corners, so that left-handed persons are not at a disadvantage. Furthermore, owing to the shape of the pan, pouring is simplified, for the contents are contained in a more confined space when tilted than if the pan were of a round shape.

The lips provide an outlet for steam when simmering, but if rapid boiling is necessary, the lid need not be precariously balanced in a "chattering" position as with a round pan, but by placing the lid crosswise, any required degree of aperture is instantly available.

The cover is also of heavy cast aluminium, and fits snugly into position. Again, awkward crevices have been avoided, and cleaning simplified. A heat-resisting knob is securely fixed to the lid. Incidentally, a heat-resisting lifting knob is fixed on the larger sized pans, on the corner opposite the handle, in order to avoid muscle strain in lifting a full pan.

Experiments with Space

Turning again to the question of shape and design, it is apparent that the pans fit the cooking stove to greater advantage than round pans. In fact, the increase in cooking capacity is over 25 per cent. Added to this is the possibility of placing three or four pans over one cooking point for simmering.

Try to do this with round pans, and with three together it will be found that the central space left is sufficiently large to allow all the heat to pass by to waste. Therefore, apart from the easier cleaning, and other advantages, square pans result in decreased fuel consumption.

I deduce from this that it would be reasonable to assume that at least 25 per cent. of fuel costs could be cut out by their use.

Although the cost of these stout pans is somewhat higher than that of the light gauge aluminium pans, the additional cost will be saved several times over because replacements will be unnecessary.

The manufacturers claim to have dis-

are unequalled. The metal is said to be of a molecular construction such that food cooked in the pans is not so easily burnt, nor will it so easily "catch," as in an ordinary aluminium or enamelled pan.

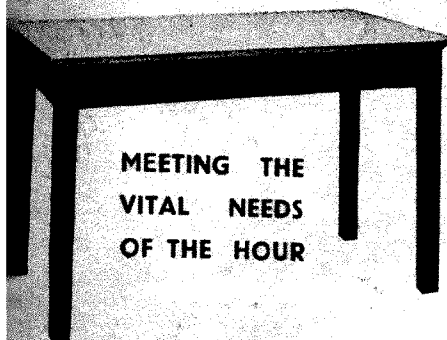
In appearance the metal certainly differs from that of the accepted aluminium pans, being of a more egg-shell-like gloss with a slightly and almost microscopically undulating surface. This surface proves to be ideal for cooking purposes, and certainly does tend in practice to lessen the risk of food "catching." This point is rather important when engaged in the preparation of sauces, gravy, etc. Incidentally it is found that such items are more successfully prepared in square pans on account of the "eddies" which occur, facilitating mixing.

The new type of pan is having a remarkably good reception, so that inclines one to think that the conservative nature of the public is not quite so strong as one might imagine. Very soon, the shape will be generally accepted as the obvious, and will be in universal use.

Personally, I should like to see the shape extended to frying pans also. Anyone who has cooked the breakfast bacon for a household, and endeavoured to lay out all the rashers without having the outer one huddled up the side of the pan, will appreciate how much more reasonable it would be to be able to lay out those rashers in a row, or to lay out sausages without resorting to the geometrical problem entailed to fill a round frying pan and turn each sausage over when "browned off."

In conclusion, a word regarding aluminium as a metal. It has been found that discolouration of the metal often occurs in the process of cooking and many were inclined to the view that harmful results on the system would accrue by the consumption of food cooked in aluminium vessels.

This has proved to be a fallacy, and although the matter has received careful investigation by the Ministry of Health, no proof of ill-effect upon the normal person has been discovered.



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FILING GETS THE BLAME

Continued from page 76

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On the subject of equipment there is not much to say. The equipment at present in use if capable of being extended is the easiest to manage without upheaval. A responsible individual definitely delegated the onus of "seeing through" a good system, and instructions clear and lucid are always available, probably already installed.

A few lines on "Snags" will not be without value.

Snag No. 1: The Loose Folder. In the writer's opinion it should never have been permitted for any but most casual sheets. A file worthy of the name must have each sheet that composes it firmly bound in.

Authorities on file design lay down as a primary objective ease of operation. Some use punched holes. This is no burden if the

typist is already provided with all her file copy sheets punched. It is complicated to punch afterwards; it causes delay because it is an extra operation to perform and punching thus done never gives accurate register and edges are uneven. Binding devices if secure, without punched holes are quite efficient.

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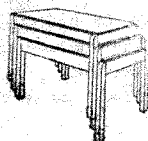
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Social Hall?

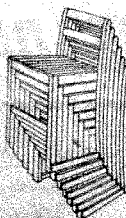
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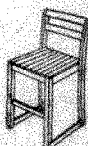
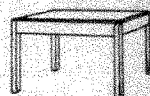
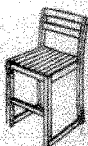
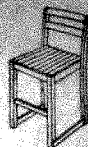
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hands it passes, for which purpose the note in accordance with the above paragraph serves.

Snag No. 2: "Who had that file last?" A card should be placed in position of every abstracted folder in the filing fixture stating its destination so that it can be called in if required. The date it went to that department or individual should be on it, and if necessary a signature as receipt. In this, imitate the procedure of the lending library.

Snag No. 3: The matter of privacy. This has to be faced. If it is so confidential that it warrants it you must file it yourself. If not, doubtless your confidence is such in some one of your filing staff that its possession can be entrusted to his or her care under the general routine.

This brings me to what I believe is seldom done with files—Stocktaking. Nor need this upset routine in any way. It is not the unholy horror of stocktaking material substances, but never less frequently than quarterly, more advisedly each month, the chief filing clerk should go through each file in his charge, see where it is if absent, and, if present, if it is complete.

Any department to whom files have been long outstanding should be followed personally—it causes less friction than writing—

to see if all are still in use or if any can be returned to the filing department.

Losses only occur where files are indefinitely retained without sufficient reason, where rush of other matters causes them to be overlooked.

The subject of personnel cannot be embarked upon here—a subject in itself—but one hint should be given. Routine may be carried out by juniors of reliability and deft fingers, but the ideal chief clerk in this department should not have a good memory. Such rely upon memory and system is deviated from. If he or she is ill or departs it is too late to rely on routine then.

A cross reference has been mentioned, and it might be stated for what it is worth that a subject index to every system has been found of immense value. Such a book should be a proper volume, locked up at night. Brevity should be the keynote, but withal mention of every document of importance with the information *where it is to be found*.

This book by pages can be indexed again in main headings, grouping subjects as may best suit needs. It is easy to follow back channels thus formed to reach the object of search, and also you have by this means a *record by date*. This has proved of assistance in locating ancient data many times. It should ever be a collateral asset not a substitute for the "double entry" principle in filing.

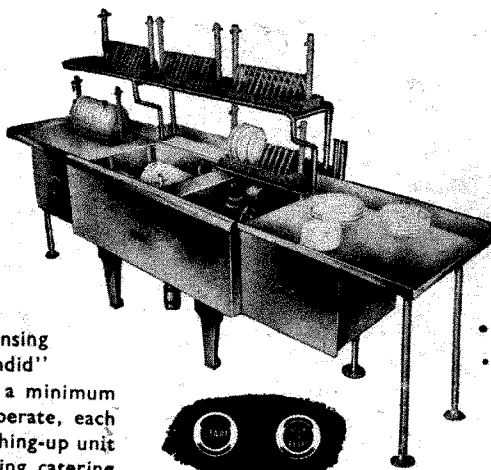
Cleaning

BY BRUSHING

THE 'SPLENDID' WAY



Underwater brushing and fresh water rinsing mean spotless crockery as only the "Splendid" will clean it. Breakages are reduced to a minimum too. Easy to install and simple to operate, each "Splendid" is a complete trouble-free washing-up unit in stainless steel as used in all the leading catering establishments. Your enquiries will be welcome.



FINGER-TIP CONTROL

A STAINES

"SPLENDID" CROCKERY
WASHERS
PATENT

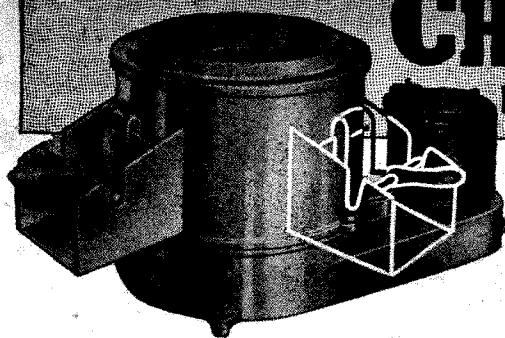
PRODUCT

TAINES KITCHEN EQUIPMENT CO. LTD.

94 VICTORIA STREET,
LONDON, S.W.1. VICtoria 9772

Scientific S.K.4

BUSINESS



ALL BRITISH CHAMPION POTATO PEELER

*which
side out?*

AS SUPPLIED TO THE
ADMIRALTY, R.A.F., AND
THE BRITISH ARMY

"CHAMPION" FOR
RESTAURANTS, HOTELS,
SCHOOLS, SHIPS, CAN-
TEENS, HOSTELS, CAMPS,
BOARDING HOUSES,
ETC.

You can install a Champion Electric Peeler almost anywhere. It requires the minimum space and the drum can be swivelled to discharge in the direction most convenient. Although so compact and handy, the Champion delivers an output exceeding that of many bulkier machines. Two exclusive features aiding efficiency are: 1. The scientific spray which maintains equal distribution of water. 2. The patent waste outlet with handy inspection cover. Write for leaflet.

MEDCALFE & CO. LTD. (Dept. C.), Champion Works
141-142 SAFFRON HILL, LONDON, E.C.1.

Phone & Grams: HOLborn 5627

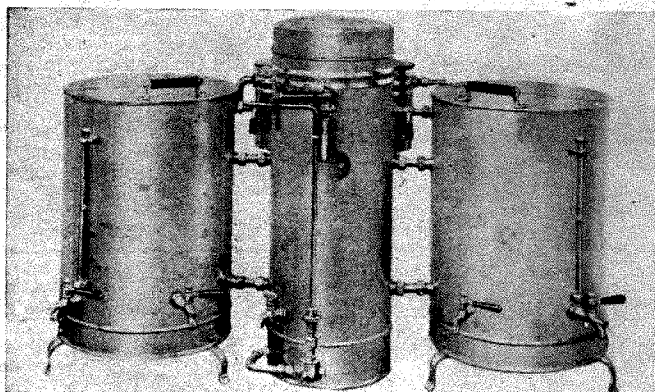


"IDEAL" EQUIPMENT FOR THE WORKS CANTEEN

HOT
CLOSETS

CARVING
TABLES

STEAMERS



BOILERS

INSULATED
URNS

FOOD
TROLLEYS

The HODGKISON SELF-FEEDING TEA INFUSING SET
Capacity to serve 320 persons with FRESHLY INFUSED TEA in 10 minutes

Many larger or smaller sizes available.

Sole Manufacturers:

HODGKISON & Co.

ABBEY WORKS, 43/45 MITCHELL ST., LONDON, E.C.1. CLerkenwell 1577



Tubular metal nesting furniture solves the problem of lack of space and labour. Clean, comfortable, attractive and easy to move metal nesting furniture will stack away when not in use, retaining its fresh appearance indefinitely, with the minimum of maintenance.

Manufactured by—

Cox & Co. (WATFORD) LTD.
WATFORD-BY-PASS, WATFORD, HERTS.
TELEPHONE · WATFORD · 5631 ·

Executives' BRAINS TRUST

Continued from page 55

MR. LEVER: If the sales manager is doing his job properly, he should often initiate the development work on the most suitable lines. That is part of the merchandising. A sales manager must study and forecast the requirements of the markets for the company's products. This includes observing changes in demand.

MR. FORD: Yes, as a result of experience from his market research and sales campaigns.

QUESTION MASTER: I know of instances where it is advisable to make the sales promotion department directly responsible to the managing director. One way round is to give the sales department an idea of the product but not let them see it. Sometimes you have to shut them off from any process of production, otherwise they will become distressed, and worried, a fatal situation.

MR. FORD: Then you are merely training them into routine officers of the company. We are really talking of a sales director. If your sales director has no vision, then you must look out for a man who has. If you had the right type of sales director, the advertising director should come under his control.

QUESTION MASTER: . . . and the sales manager. But where the sales director feels that not nearly enough drive is being put into the discovery of new markets, the design of new products, the rejuvenation of methods and models, he may be wise to appoint a sales promotion manager, to work under his personal guidance. If he is not wide enough, or resents the idea, there is nothing for it but for the managing director to appoint such a man himself and to make him responsible to himself alone.

MR. FORD: The ultimate solution is a sales director with vision, and under him should come the advertising manager.

EQUIPMENT FOR THE CANTEEN.

LABOUR SAVING MACHINES OF ALL TYPES.

TEA SERVICE URNS - BOILERS - TROLLEYS, ETC., ETC.

Write for full particulars—

KITCHEN MACHINES LTD.

7, SICILIAN AVENUE, SOUTHAMPTON ROW, LONDON, W.C. 1.

Telephone: HOLborn 8556.

Telegrams: "Kitemaco," West Cent., London

Our NEW ADDRESS



cannot
mean better

THERMOT TEA URNS

but it will
mean

EVEN
BETTER
DELIVERY

We shall be pleased to see you at our
NEW SHOWROOMS

JAMES FARQUHARSON & SONS LTD.

Park Parade, Harlesden,

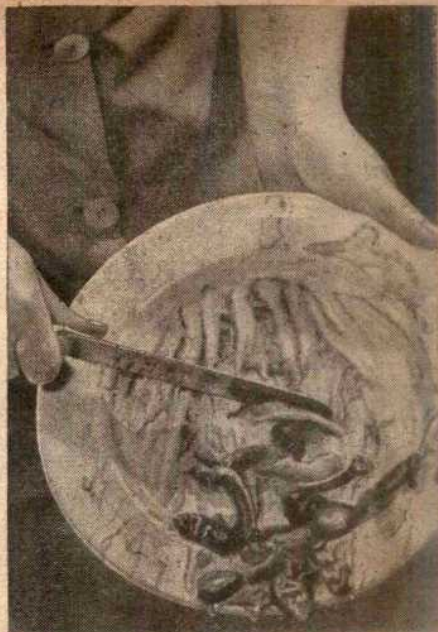
London, N.W.10. Phone: ELGar 4080 (4 lines)



We are catching up with
the huge demand, and you
can now buy direct from
the makers

The Paper Specialists

FREEDER BROS. PAPER MILLS
BRIMSDOWN - ENFIELD - Middx.



Difficult to clean? *Gusto can do it*

NO matter how dirty they are when
they reach the kitchen Gusto will
get the greasiest of dishes clean.

This non-caustic, soapless detergent,
is specially prepared for dishwashing.
It does the job quickly, efficiently and
economically. Gusto does not foam or
lather. It rinses easily leaving crockery
gleaming white, and thoroughly
deodorised.

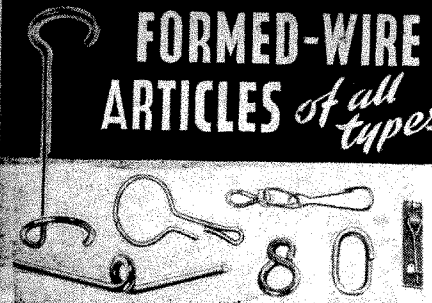
Write to us for further information
about Gusto. It's not rationed.

GUSTO

THE SOAPLESS DETERGENT

Thomas Hedley and Company Limited, Newcastle-on-Tyne

FORMED-WIRE
ARTICLES *of all types*



A. J. Pratt & Sons Ltd., 7/9 Woodbridge St., E.C.1

The
STEEL EQUIPMENT CO. LTD.
Greets Green, West Bromwich.
Phone TIPTON 1137
FOR ALL STEEL FACTORY & STORAGE EQUIPMENT
Ask for List Z.B.
See advert in last or next issue.



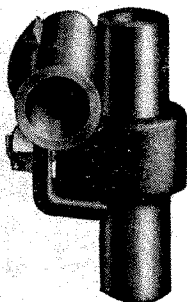
Leading Makers, since 1875, of
Diaries, Calendars and Blotters
especially for Advertising.

D. HARPER & CO. LTD.

258-262 Holloway Road, London, N.7.
Phone NORTH 3822

STORAGE RACKS

In
**Tubular
Steel**



**Quotation with Design for
your individual purpose
SUBMITTED FREE**

MILLS SCAFFOLD CO., LTD.
Trussley Works, Hammersmith Grove,
London, W.6. *Riverside 5026-9*
and at Birmingham, Southampton, Manchester,
Bristol, Cardiff, Newcastle-on-Tyne, Glasgow

CLASSIFIED ADVERTISEMENTS

RATE.—4/6 a line (average 7 words to a line).
Minimum 3 lines costing 13/6; each additional line
or part of a line 4/6. Box No. counts as one line
and is to be paid for; replies are forwarded free of
charge; 2½% discount for 6 insertions, 5% for 12.
Payment with order for single insertion.

BUSINESS BOOKS

SEVEN-DAY COURSE IN ECONOMICS. Pocket Size.
Economic Laws, Definitions and Theories, 52 Pages.
2s. 9d. R. A. Starnes, F.C.I.S., 87 Ferney Road, E.
Barnet, Herts.

DIRECTORSHIP

Experienced middle-aged business man well versed in
office and factory management with knowledge of
costing, advertising, salesmanship, etc., wants part-
nership or directorship of small undertaking making
articles for business use and which is capable of
development. Capital available £2,000 to £3,000.
Write Box 660, c/o BUSINESS, Whitefriars House,
Tallis Street, E.C.4.

EXPORT

Patentees and Manufacturers of small apparatus of
proved use in office and works, having sold upwards
of 40,000 units in British Isles at average price of
£3, are now prepared to consider offers from export
houses able to market this line abroad. Refill orders
can be relied upon from every user, and form a
steady trade in repeat orders. Applicants should
state country in which interested. Write "Export,"
c/o T. Harrop, 94 Market Street, Manchester, 1

FACTORIES FOR SALE AND WANTED

Factory wanted urgently by Company engaged on
export drive. Covered area to be not less than 20,000
square feet, on a site area of at least 2½ acres.
Requisitioned property would be considered. Con-
fidential information leading to the above suitably
rewarded. Greater London Area if possible. D. Sebel
& Co. Ltd., 55 Lant Street, S.E.1. Hop 8503.

COLCHESTER (pop. 50,000, future pop. under Aber-
crombie Scheme 72,000)—Important Freehold Ware-
house or Factory premises for sale, over 6,000 sq. ft.
floor space, electric power installed, excellent position,
own river quay, adjoining railway. Apply, Thomas
D. Brook & Son, Auctioneers, 153 High St., Colchester.

FOR SALE

Two National, Class 3,000, Accounting Machines,
4 Register, 15 and 18 inch carriage. Box 653, c/o
BUSINESS, Whitefriars House, Tallis St., London, E.C.4.

Model 40 Multilith Duplicator, complete with all
accessories. New January. Will do all classes of
letter headings, duplicating, etc. Nearest offer to
£100. Can be seen at H. Phillips (Battersea) Ltd.,
Prairie Street, Queenstown Road, Battersea, S.W.8.
Mac. 1148

Roneo duplicating machine, model No. 210 for sale,
in reasonable condition. What offers? Write Box
657, c/o BUSINESS, Whitefriars House, Tallis Street,
London, E.C.4

MISCELLANEOUS

Manor Collapsible Transfer Cases, re-introduced, avoid
untidy parcels of records. Quarto 11s. per doz. Fool-
scap 12s. per doz. tax and post paid. B. Matthews
& Son Ltd., Yates Street, Birmingham, 6.

Efficiency Audit. Your Office Organisation placed on
sound efficient basis by Consultant with wide and
successful experience. Distance no object. Box 658,
c/o BUSINESS, Whitefriars House, Tallis Street,
London, E.C.4

WANTED

TIME RECORDER WANTED. State make, condition
and price. Write Box 966A Smiths' 100 Fleet Street,
E.C.4.

Ex-Service Man returning to business urgently
requires second-hand typewriter. Carriage paid and
reasonable price given. Will reader or firm assist.
Letter to Box 640 c/o BUSINESS, Whitefriars House,
Tallis Street, London, E.C.4.

KARDEX CABINETS Wanted, also Modern Duplica-
tor and several Standard Typewriters. Box 652, c/o
BUSINESS, Whitefriars House, Tallis St., London, E.C.4.

Biro

MARKS A TURNING POINT
IN THE HISTORY OF

Writing



RETAIL
PRICE
55/-
including
purchase tax.
Refill units 5/-

"BIRO" is unique: it writes with a ball-bearing point—a point that never goes wrong, never floods, bends or splutters—a point that rolls your writing on to the paper with effortless ease. "BIRO" ink dries as you write; you cannot smudge it; you need no blotter.

"BIRO" writes approximately 200,000 words without refilling. To replenish "BIRO" for a similar period of service, a refill unit is inserted while you wait.

"BIRO" is obtainable **ONLY** from stationers and pen shops, but the demand has far exceeded capacity. Consequently we ask your indulgence if your dealer cannot supply you at once.

Manufacturers:
THE MILES-MARTIN PEN CO. LTD.

Wholesale Distributors:
Sir Henry Luna, Ltd., 15 King St., St. James's, London, S.W.1

TOWARDS



**EXECUTIVE
FREEDOM**

No man needs freedom more than the executive—and few get less of it.

He needs freedom to think, to plan, to organise. Yet only too often he finds his energies crippled and limited by masses of detail work.

The dictating machine helps to cut swiftly through clogging masses of detail and routine. Because it is *always ready*, automatic and tireless in action, detail jobs are dealt with instantly and completely as they come to the executive desk. No waiting, no call for the shorthand writer, no delay—just a few words spoken swiftly to the machine and you pass on to the next job.

No other method will give you such a measure of freedom. In no other way can you save so much invaluable time for executive's true function of thinking, planning and organising. An hour a day at the very least.

Get to know the

Dictaphone

Dictating Machine

and watch the masses of detail melt away off your desk.

THE DICTAPHONE CO. LTD.

(Thomas Dixon, Managing Director)

(Dept. H) **KINGSWAY HOUSE, KINGSWAY,
LONDON, W.C.2.**

Telephone: HOLborn 4161 (5 lines).

And at **MANCHESTER, BIRMINGHAM, GLASGOW, BRISTOL,
LEEDS, LIVERPOOL, NEWCASTLE-ON-TYNE, DUBLIN
and BELFAST.**

THERMAL LINKAGE

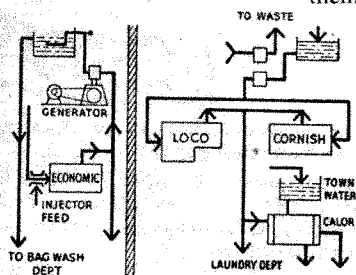
SAVES LAUNDRY

23% OF COAL BILL

*More plants, of all types,
adopt proved production-
economy technique*

Thermal Linkage saves fuel. Thermal Linkage cuts production costs. Thermal Linkage increases output. Those are the three proved reasons why progressive factories everywhere are adopting Thermal Linkage.

Thermal linkage means integrating your various heat-using processes and, as far as possible, operating them as a single co-ordinated heat-using unit. Instead of being independently supplied to several separate points of consumption and the surplus going to waste, heat is circulated and re-circulated from point to point so long as there is work for it to do.



LAUNDRY'S BIG ECONOMY BEFORE

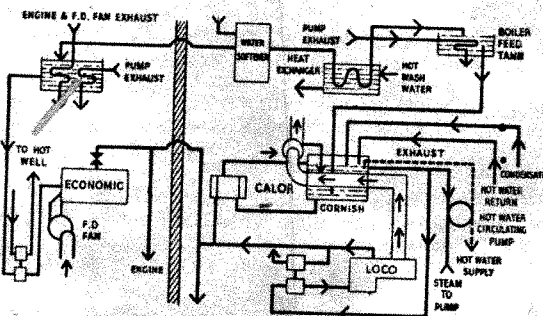
Thermal Linkage—

A laundry, in two sections (with separate boiler plants), one each side of a road, used 5,550 lb. of steam per hour and consumed 41 tons of coal weekly.

AFTER

Thermal Linkage—

The laundry maintained the same output on a reduced coal consumption of only 31½ tons per week. Replacement of a condemned boiler was also rendered unnecessary, saving £6,000 of new plant.

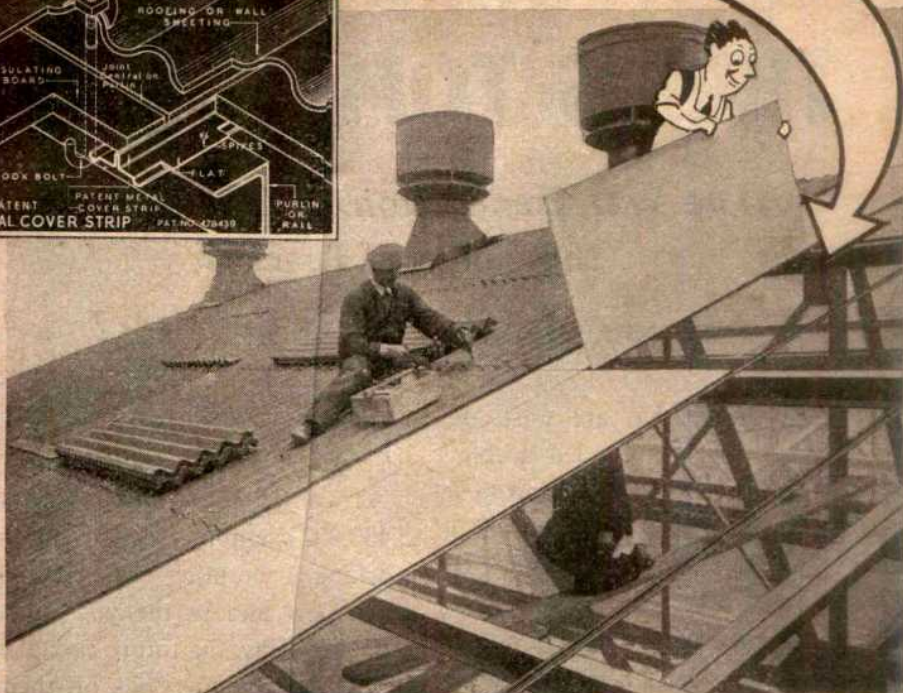
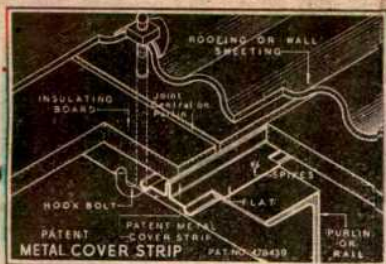


FOR COMPLETE DETAILS SEE "FUEL EFFICIENCY NEWS"
DECEMBER, 1945.



ISSUED BY THE MINISTRY OF FUEL AND POWER

PUT TENTEST HERE — says George



A half-inch layer of TenTest insulating board between purlins and corrugated roofing reduces the heat loss through the roof by 73½%. The following figures relate to the insulation, by the Patent Metal Cover Strip Method, of a typical factory roof of 100,000 sq. ft. and are based on Chart 1 of Fuel Efficiency Bulletin No. 12 (Ministry of Fuel and Power).

Capital saving on heating plant - £6,500

Cost of insulation @ 9d. sq. ft. - £3,750

NETT CAPITAL SAVING - £2,750

Fuel saved per heating season - 570 tons

Annual value of fuel saved
@ 50/- per ton - **£1,425**

Note that the fuel saving alone would pay
for the insulation in about 2½ years.

• **TENTEST FIBRE BOARD Co. Ltd.**
75 Crescent West, Hadley Wood,
Barnet, Herts. Barnet 5501 (5 lines)

JULY, 1946

If you would like to study the effect of Structural Insulation in *your* buildings, either existing or proposed, send the coupon below and our technical representative will make a free survey and give you facts and figures. If you decide to insulate, our Specialised Construction Department is fully equipped to undertake supplying and fixing complete to ensure your entire satisfaction.

COUPON

To TenTest Fibre Board Co. Ltd.,
75 Crescent West, Hadley Wood, Barnet, Herts.

Please put your technical representative
in touch with us.

NAME

POSITION

FIRM

ADDRESS

PHONE

Type of building

Proposed or existing

THE WORLD WILL BE THEIRS TOMORROW

*The War Generation is picking up
the Tools of Peace*

Are you planning for their needs?

IN the six years that are past, the younger generation needed nothing except the implements of war. Now their needs are those of peace. These 16 million young men and women—among whom are the future masters of industry and commerce—are now planning for homes and children. And, after years of scarcity and restrictions, they represent an immense market, with as yet unformed brand preferences.

But this war generation is not easily understood. They have seen much and thought a great deal. And to appreciate their hopes and ideals is to see something of the world they will make.

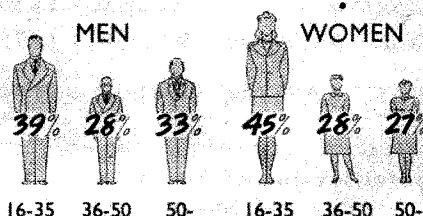
For a long time, it has been the editorial policy of the Daily Mirror to reflect and guide the thought of these young men and women. That this policy has succeeded can be seen from the fact that a greater proportion of the Daily Mirror's readership is among the under

35's than is the case with any other national newspaper.

42% of the Daily Mirror's net sale of 2,400,000 is among this ambitious, hard-working generation—who need possessions now and in the years to come. Unequivocally, the future capital wealth of this country depends on them, and although space is temporarily overbooked, the Daily Mirror deserves a high place in your first real post-war advertising budget.

WHO READS THE DAILY MIRROR?

WHAT ARE THEIR AGES?



DAILY MIRROR

**Net sale in excess of 2,400,000 — second largest in the world*

"THAT'S OUR NEW EXTENSION.
ALL THE FURNITURE, PARTITIONS
AND FITTINGS ARE STEEL BY
Sankey-Sheldon OF COURSE"



Sankey-Sheldon, 46 Cannon St., London, E.C.4

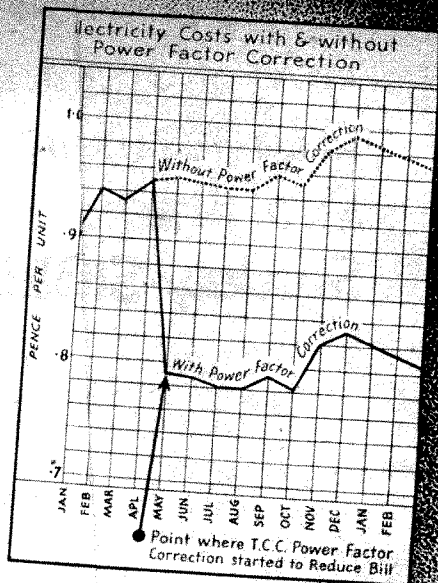
How to get *your* ELECTRICITY CHARGES REDUCED

It can be done—without drastic economies or alterations in plant. Contrary to popular belief, electricity bills are not a fixed overhead. These are based on current consumed, and it is the efficiency in current consumption which determines the cost to you. The difference between the current you consume and the current you actually require is caused by the "Power Factor," a term used by technicians to indicate the percentage of the total current in the electricity mains which does useful work. Without Power Factor Correction you are paying for all current consumed—that is, both "useful" and "idle" current.

Why do it? Remove the idle current from your system and, what is more important, from your bill! Why pay the penalty of low power factor when the Supply Authorities offer a substantial bonus for Power Factor improvement?

Power Factor Correction is simple to arrange and instal, and will not interfere with normal production work. The equipment is entirely "static," requiring no attention and very little maintenance.

The savings effected represent a dividend of 50% to 100% per annum on the cost of the Capacitors. In certain cases even better results are obtained.



The above graph shows how electricity bills can be lowered once T.C.C. Power Factor Correction Capacitors commence to operate. It is typical of many thousands of such installations now in operation.

A few of the businesses enjoying large cash savings with T.C.C. Power Factor Correction Systems:—

Armstrong Siddeley Motors, Ltd.
British Oxygen Co., Ltd.
Vickers Armstrong, Ltd.
Harland & Wolff, Ltd.
Humber Hillman, Ltd.
T. Wall & Sons, Ltd.
Glaxo Laboratories.
Rolls Royce, Ltd.

T.C.C. will guarantee savings...

In cases where we are given an opportunity of carrying out our own tests, we will give a definite guarantee of performance and saving. A visit from one of our engineers will enable us to submit for your consideration a complete scheme, including an estimate of the savings which you can effect on your annual electricity bill.

A London Dairy Co. is
SAVING £450p.a.

A London Glass Bottle Manufacturer is
SAVING £1,130p.a.

A Midland Cement Mill is
SAVING £1,300p.a.

... and all by installing T.C.C. Capacitors for Power Factor Correction.

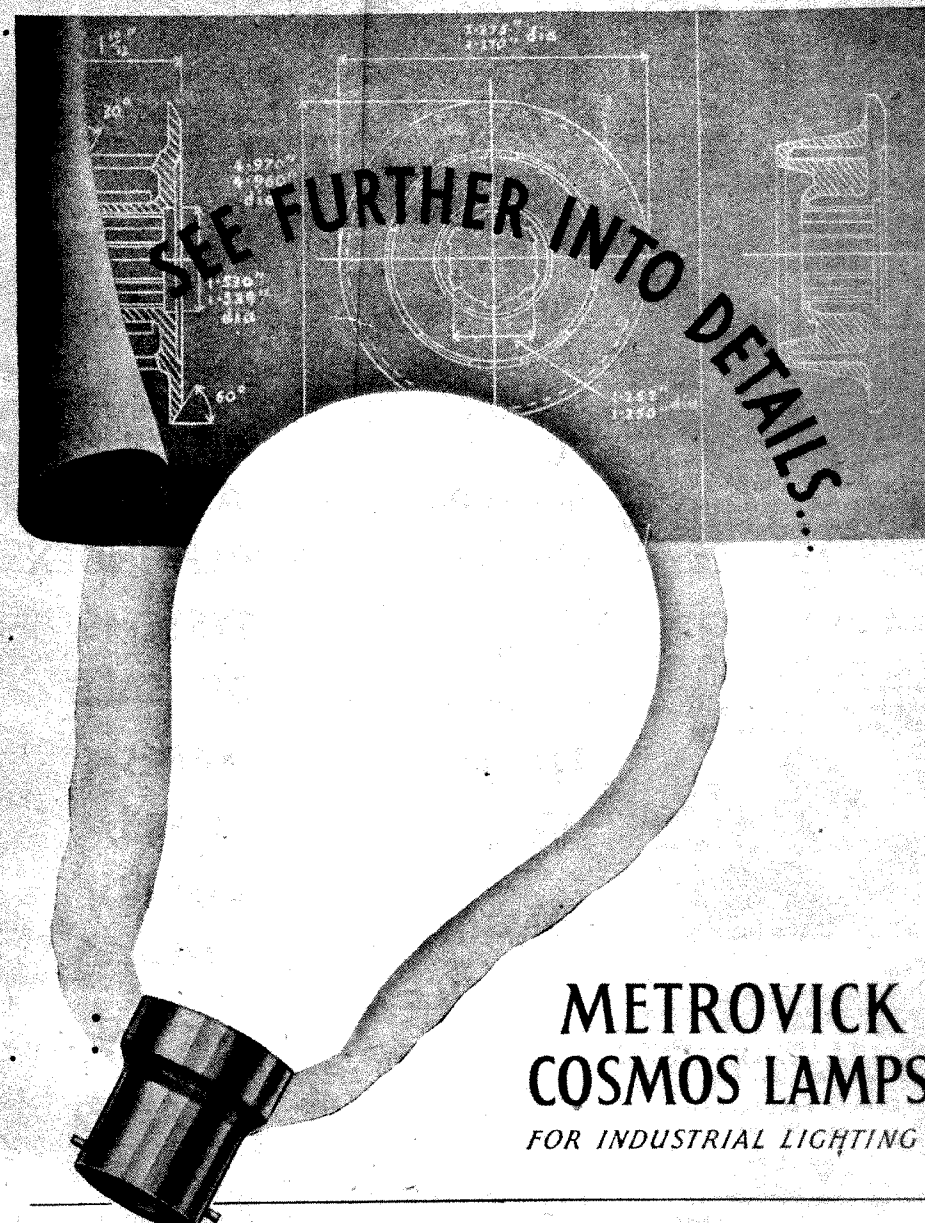
Why not investigate your Power Factor? It will cost you nothing for an investigation by one of our expert engineers and you will be involved in no obligation whatsoever.

THE TELEGRAPH CONDENSER CO., LTD.

INDUSTRIAL DIVISION

NORTH ACTON · LONDON · W. 3

Telephone. ACORN 0061



SEE FURTHER INTO DETAILS...

METROVICK COSMOS LAMPS

FOR INDUSTRIAL LIGHTING

METROPOLITAN-VICKERS ELECTRICAL CO. LTD
NUMBER ONE KINGSWAY • • • LONDON, W.C. 2



TAYLORS FOR ALL TYPEWRITERS

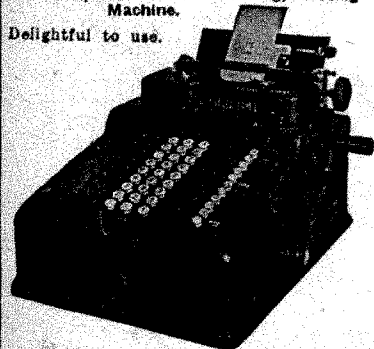
Adding Machines, Duplicators, Cash Registers, Calculators, Time Recorders,
and All Business Appliances BOUGHT AND SOLD, HIRED AND REPAIRED

SAVE TIME — HIRE AN ADDER FOR STOCKTAKING

ADDOGRAPH

The Simplest Portable Adding, Listing
Machine.

Delightful to use.



8 col. to add from 1d. to £9,999 19s. 11½d.
9 col. to add from 1d. to £99,999 19s. 11½d.
Hand and electric models with or without
subtraction and wide paper carriages.
No modern Office can afford to be
without one.

**NO MORE ERRORS—JUST USE THE
GUARANTEED ADDOMETER**

Rapid Automatic Addition & Subtraction.
Rests flat on the books. For Decimal or
Ordinary Figures and Feet and Inches, etc.

FOR POCKET OR DESK.
So Simple Anyone can use it.

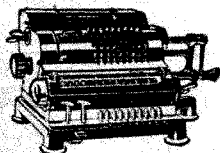


In Flush-lined, duco-d case.
Size, 11¼ × 2½ × ¼ in., £4 15s.

MONEY MODEL

Adds to £9,999 19s. 11½d. Price 25 6s.
When ordering state for what purpose
required. Also a cheaper pocket Adder for
ordinary figures and Indian money, in
case, 30/- post free.

**ROTARY CALCULATORS
ALL MAKES**



For all calculations. Multiply, divide,
add and subtract in 1/10th time taken
to do so mentally.

HIGHEST PRICES

**PAID for all
Makes of Modern**

**Office
Machinery:
Adders,
Calculators,
Cashiers,
Addressers,
Duplicators,
Typewriters,
Steel Safes
& Furniture**

**URGENTLY
WANTED**

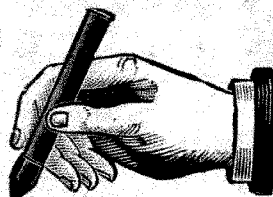
FOR

**NATIONAL
SERVICE**

Turn your
**SURPLUS
OFFICE
EQUIPMENT
INTO CASH**
and help the
War Effort

THE ALL-RUBBER DAMPER

gives squeeze control of moisture.

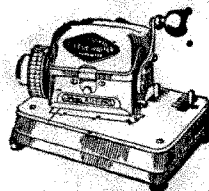


THE TAPPIT ALL-RUBBER DAMPER.

Ever Ready and Hygienic.
A squeeze controls feed of moisture.
2/- post free.

**A FEW
VISIBLE INDEX
SYSTEMS
FOR SALE**

**SAFES,
DESKS,
CHAIRS
& TABLES**



**ELIMINATE LOSS AND FRAUD BY
USING A "SAFEGUARD," THE BEST
CHEQUE PROTECTOR**

Used by leading Banks and firms. Do you
realise that an altered cheque is your
own liability? Price £12 12s.

All makes of Cheque Writers at
bargain prices.

Phone: Holborn 3793, or write

TAYLORS TYPEWRITER MARKET

74 CHANCERY LANE (Holborn End),
& at Maidenhead. London, W.C.2

Help for Employers seeking men for Executive Jobs

AFTER the 1914-18 war, great resources of talent and ability were lost to business and industry. There was no national machinery then for singling out, from among the returning Servicemen, those of exceptional promise.

Now, as then, qualified and experienced men and women with the capacity for responsible posts are coming rapidly out of the Forces and out of war industry, or are becoming available from other civilian employment. And great numbers of younger men, too — men with little or no experience in business or industry but with qualities of resource and leadership matured by war — are returning to civil life.

But this time the Government is putting at the disposal of employers a free, nation-wide appointments service whose function is to provide a field of candidates from which employers can recruit their executive, managerial, or administrative staffs.

MATCHING MEN AND JOBS

Thirteen Regional Appointments Offices are interviewing, registering, and classifying all of these

men who come to them. Those who are without previous experience in their chosen field are assessed by modern, tested methods of "screening," to discover special aptitudes and potentialities.

Thus, the best men available for a given job are selected. The employer can draw upon the whole country for the type of man he is seeking, without wasting time in fruitless interviews; suitable candidates *only* are submitted for his selection.

The Appointments Offices do **NOT** exist to find jobs for all who apply to them, regardless of ability; their task is to see that able men and women are put forward for responsible jobs, and to offer business and industry the choice of the best talent available. (They do not deal with jobs which are normally notified to the Employment Exchanges.)

The Appointments Department have successfully filled more than 27,000 responsible posts since VE-day.

Whatever your needs may be for experienced or potential executives, you would be well advised to get in touch with your Regional Appointments Office.

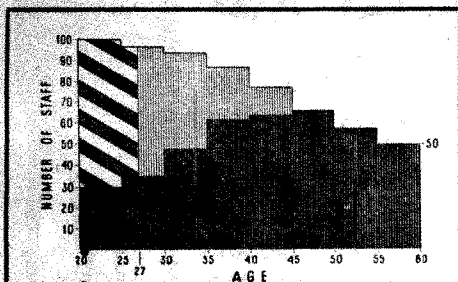
It is likely that the man you are seeking is on the register of one of the Appointments Offices — or will be as soon as his release group is reached. If he is not, the Appointments Offices will help you find him.

ASSISTANCE IN TRAINING

Even if your needs are not immediate, you will want to enquire about the training schemes by which promising candidates are being assisted to complete their professional or technical education, or to take a business training course.

Write, telephone, or call. The Regional Appointments Offices are in the following towns:

LONDON: 1-6 Tavistock Square, W.C.2
BIRMINGHAM: 239 Broad Street
CAMBRIDGE: 5 Salisbury Villas, Station Road
READING: 23 Valpy Street
BRISTOL: Lyndale Hotel, Berkeley Square
NOTTINGHAM: Commerce Chambers, Upper Parliament Street
LEEDS: Greek Street Chambers, Greek Street
MANCHESTER: Commercial Chambers, 47 Corporation Street
LIVERPOOL: Cotton Exchange, Bixteth Street
NEWCASTLE-ON-TYNE: 153 Barras Bridge
EDINBURGH: 5 Rothesay Terrace
GLASGOW: 450 Sauchiehall Street
CARDIFF: 8 Cathedral Road



THE SEVEN-YEAR GAP. Employers trying to make up for the lost years, when they could not recruit promising young men to train for executive jobs, are finding the Appointments Offices a valuable source of "material."

The above chart represents the staff structure of a typical engineering firm. In grey: men called away. In black: the war-time staff, reserved or unfit. In stripes: the 20-27 age gap now left, even after reinstatement of pre-war employees.

Unfilled, this gap will mean a dangerous staff shortage, in ten years' time, of the 30-37's; in twenty years' time, of the 40-47's. It can be filled only by men between 20 and 27 returning to civil life. Most of those of executive calibre are applying, on release, to the Appointments Offices. That is where employers are finding the talent they want.

**SAVE PRECIOUS
MINUTES EVERY HOUR
staff location..**

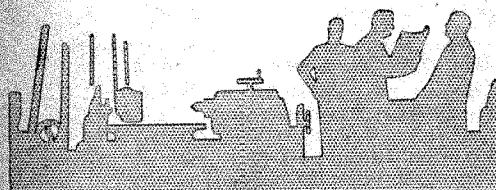
is just one of the essential
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locating staff executives.

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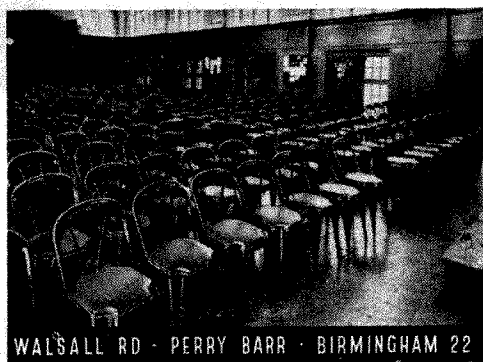
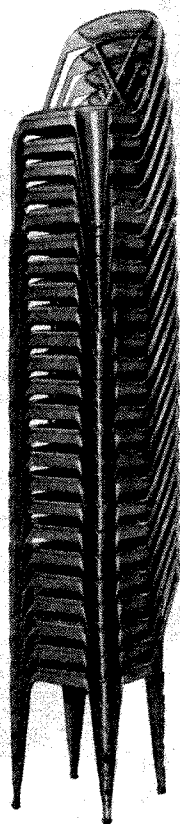
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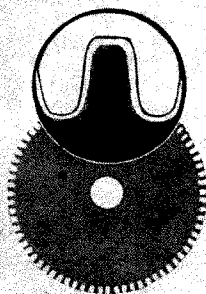
Speed up Production with Radio Heating



The Redifon R.H.7, 1½ kW radio heater, showing the special heating chamber for plastics, clay, rubber, etc., in the open position

AN AMAZING VARIETY of industries can increase production extremely economically by using radio heating in either the dielectric or eddy-current method of application.

The dielectric process, by which materials that are bad conductors of electricity are evenly heated simultaneously throughout, can reduce many heating cycles by over 50%. Plastic pre-forms and powders can be heated at over 1 lb.



The case-hardened surface follows the exact contour of the gear wheel, as shown in this micro-view

per minute; glued joints in wooden structures and veneers can set in a matter of seconds; clay articles can be dried out with a greatly reduced number of rejects; water can be evaporated from textiles at any stage in manufacture, at a rate of 6 lbs. per

hour, and thick sections of rubber can be fully vulcanized all the way through. These are only a few applications for Redifon Model R.H.7 in dielectric heating.

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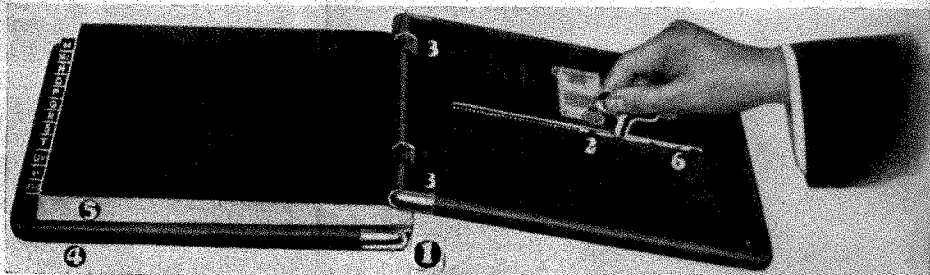
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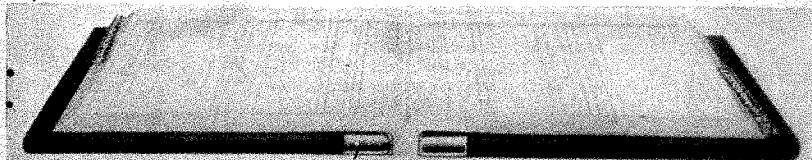
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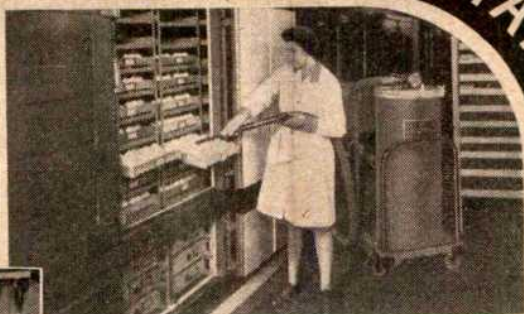
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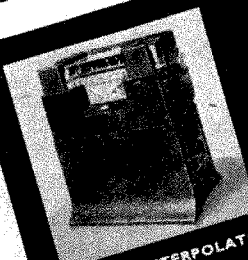
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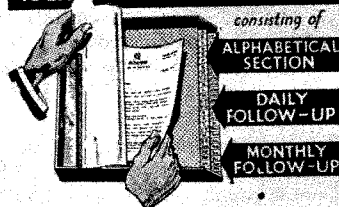
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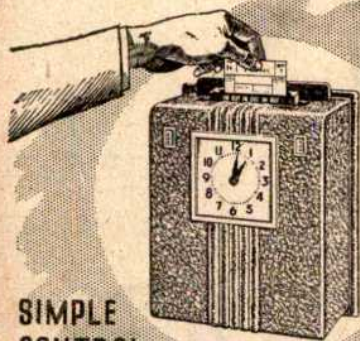
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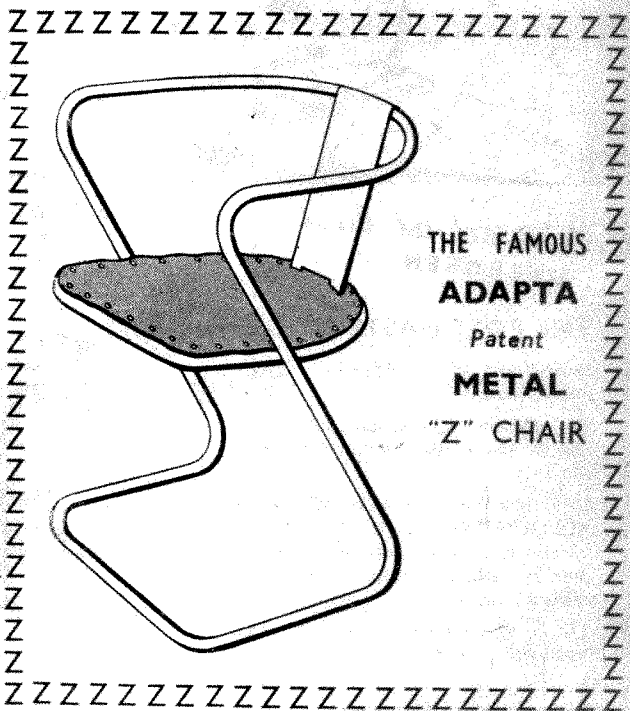
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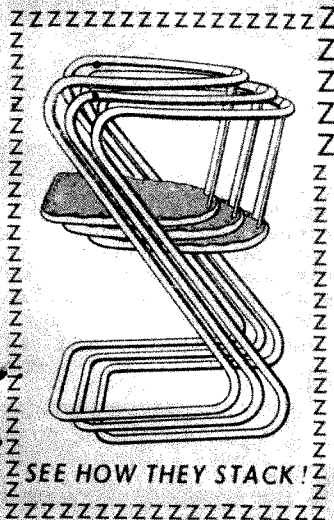
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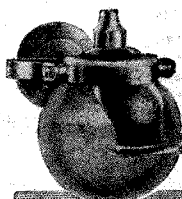
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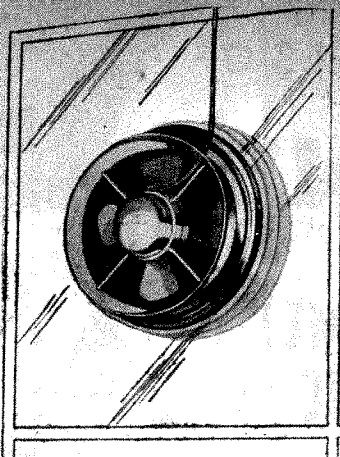
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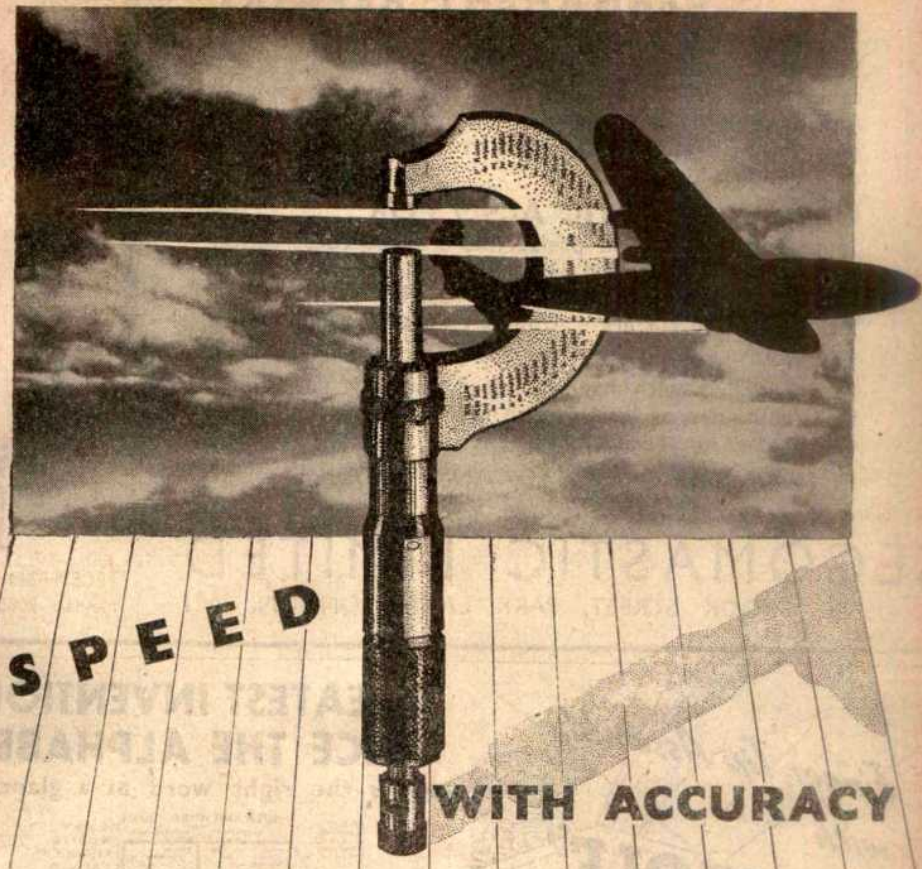
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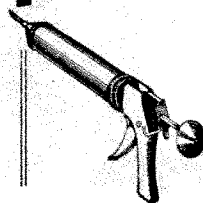
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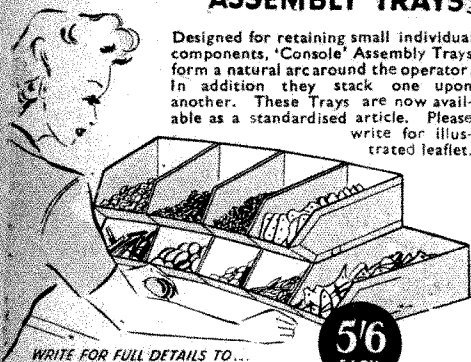


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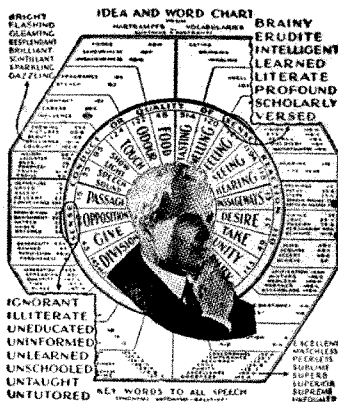
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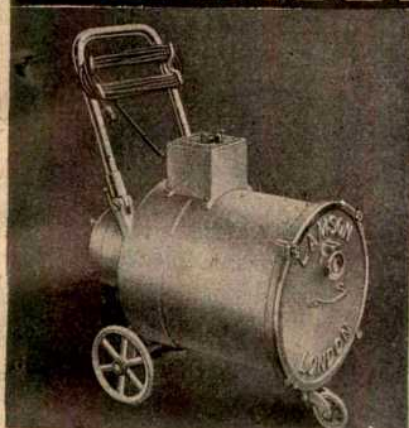
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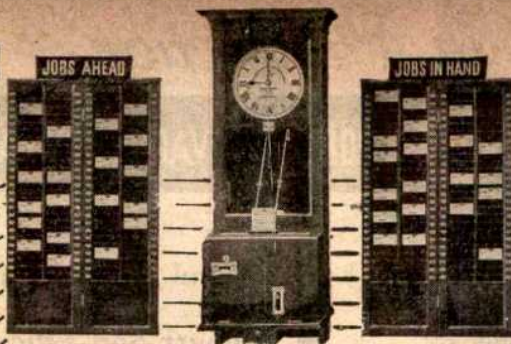


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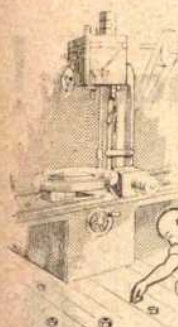
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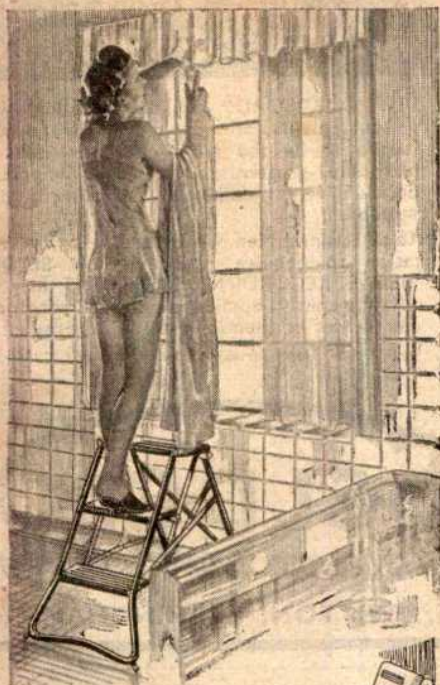
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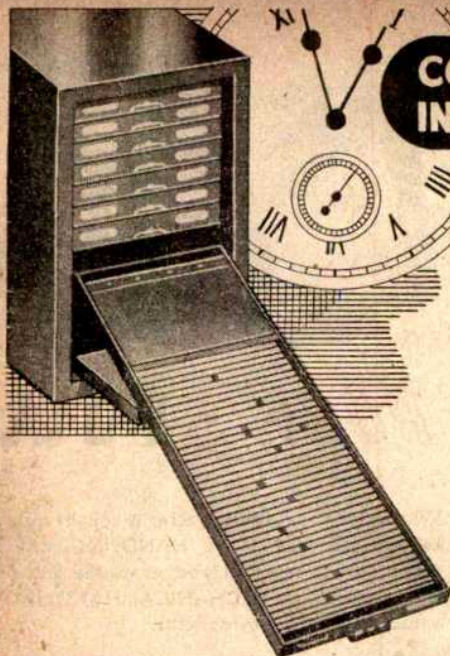


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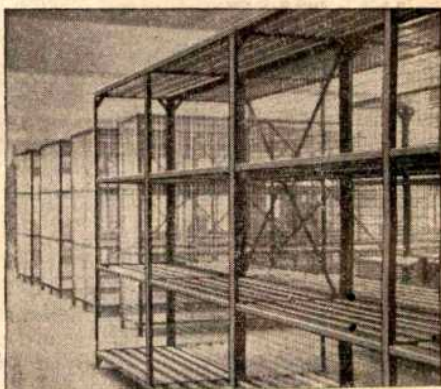
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JULY

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JULY and half-year with it. Business discerns the gold brightening the gray of earlier months. War-time achievements are now being turned to peace-time uses. Opening feature this month brings the latest facts as management wants them on Electronics—the work they can do in your plant—the man hours they can save. And P.M.H. No. 7 retains the motif by giving the plan for cutting out your indirects. A new industry surveyed this month—Synthetic Gems.

FOR the Office Manager new days loom ahead bringing new equipment and new techniques. Arthur Bartram tells the story of the new 29-key dictation machine. Sales Managers can learn how to handle salesmen in times of short stock.

NEXT month G. S. Ranshaw follows Electronics with Instrumentation. Supporting features—P.M.H. from the Midlands; a novel reconversion—how a new war-time firm is switching over to a peace-time consumer product from scratch.

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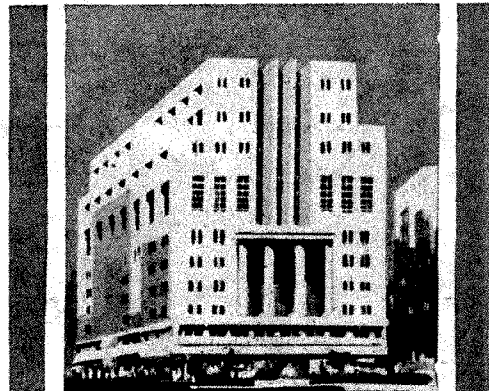
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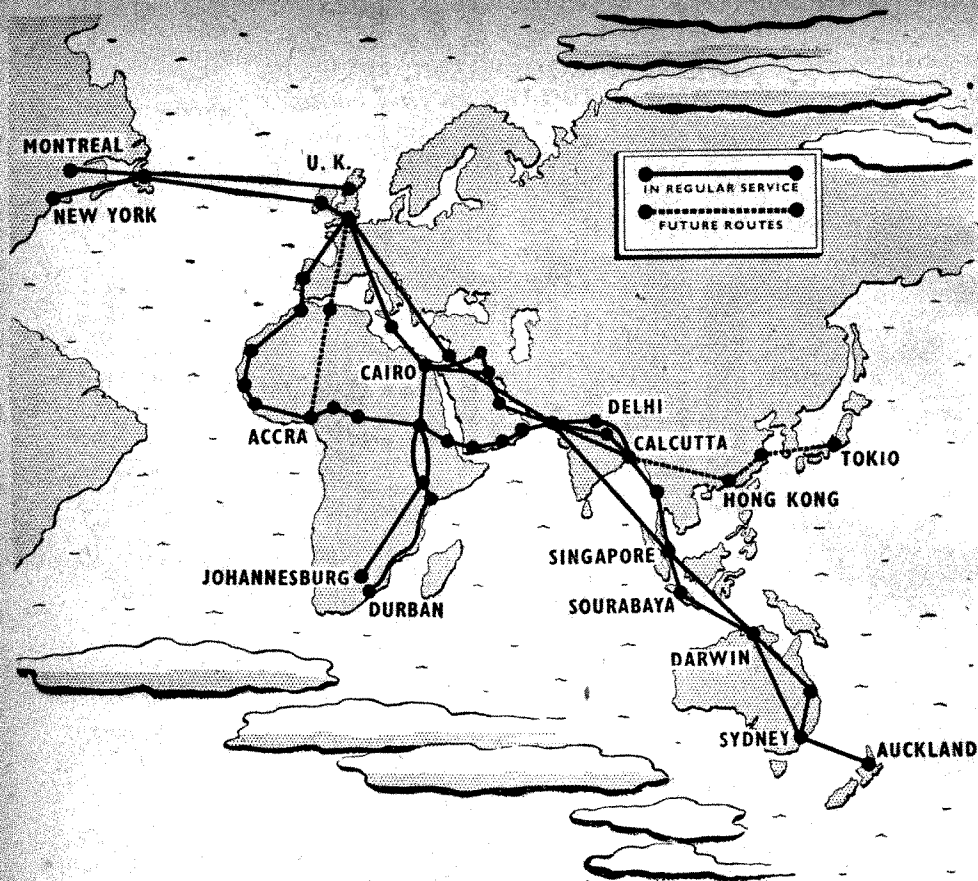
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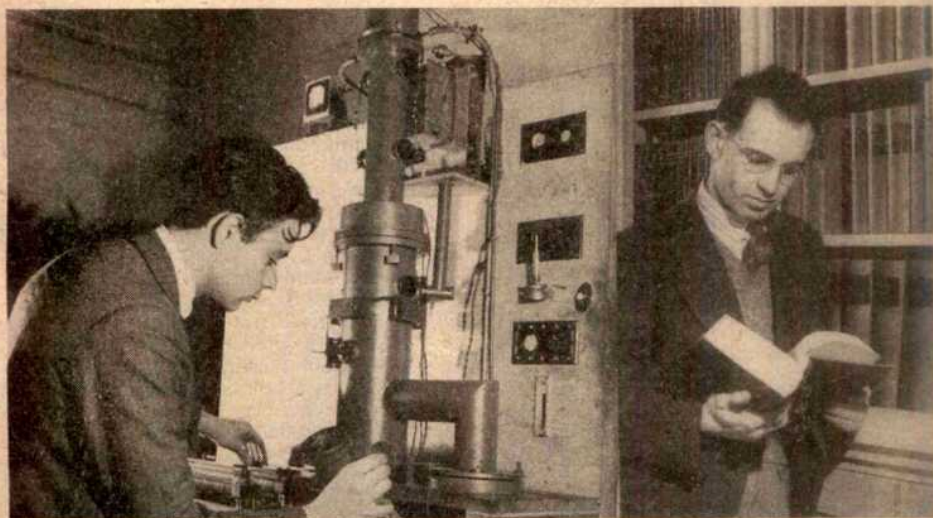


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Now You Can Put Electrons to Work



By G. S. RANSHAW, Ph.D.

Newest Tools for P.M.H. with Speed, Refinement and Accuracy

IN America, which is steadily being "sold" electronics in a high-powered fashion through the nation-wide campaigns of big electrical enterprises, it has been estimated that as yet only five per cent. of industry is equipped with the electronic devices it might profitably use. In this country the corresponding figure would probably be less than one per cent.

Yet the case for the application of electronics to the vital task of stepping-up P.M.H. in Britain to-day is tailor-made. Both directly and indirectly, use of electronic devices influences production in a positive predictable manner. The speed, refinement and accuracy which constitute the major contribution of electronics to industrial efficiency are so superior to the corresponding attributes of the human organism that the effect of substituting the one for the other is direct and immediate.

On the other hand, although the application of an electronic device may bear only indirectly on an industrial process, in that it cuts

down spoilage, refines the process, or ensures complete safety, it cannot be denied that each and every one of these factors has an ultimate beneficial effect on P.M.H.

In view of this it is pertinent to ask whether the present attitude of British industry to electronics is symptomatic of mere apathy towards a "new-fangled idea," whether it is due to lack of informative publicity, or whether there is some more deep-seated cause.

That apathy exists to a certain degree in some quarters is only to be expected; that more educative effort must be put into the publicity of specialist electrical firms is apparent on comparing their literature with that of their American counterparts; but the real cause of the trouble lies deeper—lies, as a matter of fact, in the very nature of electronic technique itself.

The fact is that very little industrial electronic apparatus comes on the market as a complete unit, ready for use. With certain notable exceptions (welding equipment, u.h.f.

heating installations, p.h. meters, gas analysers and so on) every electronic device must, in general, be designed *ab initio* for one specific application, and one only.

This means that there must be creative collaboration between the industrial specialist and the electronic engineer. Hitherto, however, 90 per cent. of installed applications have been due to the initiative of the latter, whereas, if the electronic mode of thought is really to strike root in British industry, it *must* be with the former that the initial demands for such equipment originate. To use a hackneyed but expressive phrase: industry as a whole must become electronics-conscious.

Fundamentally, therefore, the matter is one of *procedure*. Recognising within his own province a problem that might be solved, an operation that might be speeded up, a bottleneck that might be eliminated with the help of a suitable electronic device, it is incumbent on the industrial specialist to bring in the electronic engineer. If conditions are favourable the latter will then respond with a circuit and possibly its accompanying mechanism. The rest is largely a matter for the cost office.

The operative word there, however, is "recognising." How, unless he is well-versed in all the latest trends in electronic engineering is the non-specialist to "recognise" suitable opportunities? How is he to *know*, for instance, that at a particular point in his production line there is a space which calls out for a label with the legend:

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for an
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DEVICE

Most executives in industry lack the technical foundation which might enable them ultimately to master the intricacies of a subject which absorbs the whole-time energies of some of the best brains in the electrical industry, nor has the general technician sufficient leisure to devote to what may be to him an entirely new line of country. *But such thoroughgoing preparation is not essential in either case.* The fundamental principles of electronics are simple and unequivocal. They can be assimilated rapidly by anyone with average intelligence. All that is needed is a knowledge of the "tools" of the electronic engineer, their working, their uses, and the possibilities of their integration. Armed with this knowledge it is possible to say decisively, in all but the most abstruse cases, whether any particular problem is likely to be amenable to solution by means of electronics or not.

It is the object of this first article to describe the "tools" mentioned, after which it will be possible to explain some instances in which they have been integrated successfully into workable electronic devices.

The word "electronics" has been used rather glibly recently by popular writers and has come to be regarded by the uninformed

as a mysterious agency which is going to revolutionise everyday life, enabling us to accomplish all sorts of tasks without effort and performing the miraculous as a matter of course. The reader, however, is asked to accept with caution a great deal of what he hears about electronics from other than strictly reliable sources, although this is by no means to belittle the contribution it has made to human progress. To it we owe modern telegraphy, wireless, television, radio-location, talking pictures, picture transmission and so on. But these are the spectacular things.

More Speed, More Accuracy

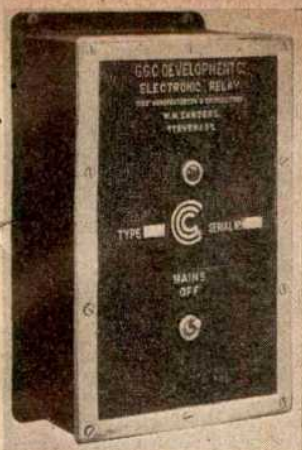
It is the thousands of intricate, laborious, depressing jobs, performed at present by human hands, and which electronic devices will ultimately banish, in which it will be of the greatest value to the greatest number. Electronics can and will take the drudgery out of hundreds of working tasks, performing them automatically, with increased speed and accuracy.

To mention only one of these applications: sheet steel for making tin cans now races off the rolling mills at 1,000 feet per minute, so fast that the human eye cannot hope to spot tiny pinholes which might cause a leakage or give rise to cases of food poisoning, but the electronic "eye" can watch, spot and mark holes as small as one hundredth of an inch in diameter as the sheet rushes by.

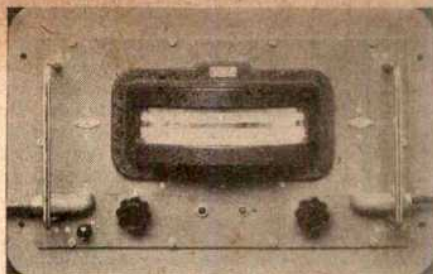
The new science of electronics can be said to have made its start in 1907 when Lee De Forest invented the three-electrode valve, developing and advancing on earlier work by the late Sir Ambrose Fleming. But it was subsequent to 1920, when broadcasting started, that labour in this field gained momentum and led to the ultimate perfection of the modern valve. Nowadays, however, important as the wireless valve is, its significance is completely overshadowed by that of its industrial counterparts.

Electronic tubes, the tools of the electronic engineer, take many forms, but the seat of power in all of them is the "electron," a constituent of all matter, and assumed for all practical purposes to be an infinitely small particle carrying unit negative charge. It is so small compared with its opposite number, the proton, that its mass may be neglected, the weight of an atom of any element being considered to rest wholly in the "nucleus." The nucleus is comprised of all the protons and about half the electrons, the remaining electrons revolving round it as satellites at relatively large distances.

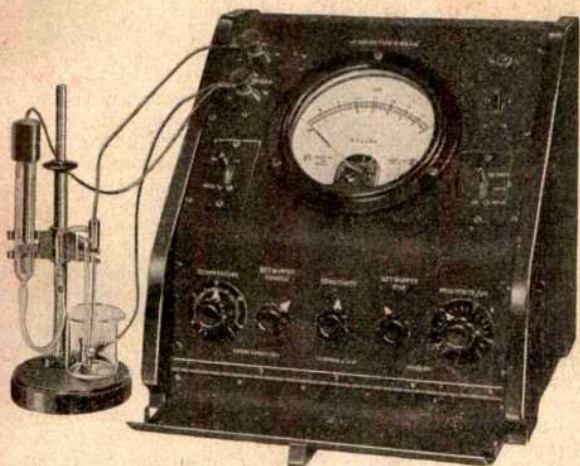
Control of the electron has been the task of the electrical industry since its inception, but with the coming of the valve the word electronics has generally been confined to devices in which electrons perform their task *in space*, and not in a solid conductor such as a copper wire. For after all, the whole of the electrical industry is founded on electrons,



Left: The Electronic (G.E.C.), which Dr. Ranshaw will treat in his subsequent features



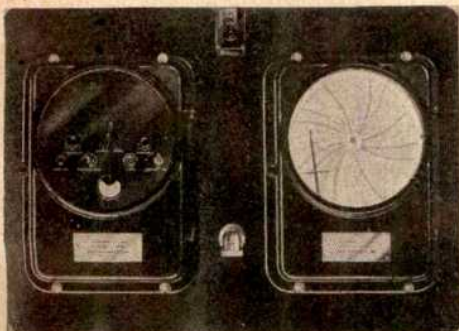
Above: The degree of alkalinity or acidity in solutions is shown on the modern scientific P.H. scale, by the Marconi indicating electrometer



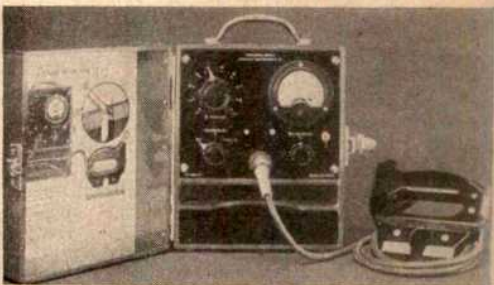
This is a P.H. meter manufactured by Muirhead & Co. It has a similar function to the Marconi indicating electrometer



The Henry Hughes Supersonic Flaw Detector is a portable, non-destructive instrument for detecting flaws in ferrous and non-ferrous metals, or in other material. A cathode ray tube is used as indicator



Another Marconi P.H. recorder. It is invaluable for the control of industrial processes



Instantaneous determination of the moisture content in timber is given by this Marconi instrument. Similar instruments determine the amount of water in petrol or cotton

the modern conception of an electric current being simply the "flow" of electrons from one place to another.

Usually associated with matter, therefore, the first job in electronics is to disembodify the electrons.* This can be done in several ways. They can be ejected, "pulled out," from metal by applying a high voltage; they can be ejected from certain metals by a beam of light; or they can simply be "boiled out" by the application of heat.

The latter is the easiest method and many vacuum tubes utilise an electrically heated filament as electron-source, these being shot out from the metal atoms of the wire which are conceived of as being in a state of violent motion due to heat. Normally, of course the free path of these molecules would be very small due to collisions with molecules of the gases forming the atmosphere, but modern methods can so highly evacuate these tubes that collisions become a rare occurrence.

Just Like The Wireless

Once electrons have been obtained free of the filament we can do things with them. For instance, if the tube also contains a metal plate which can be charged positively, the swarm of electrons, equivalent to a flight of negatively charged particles, will be attracted to it. In this way we can create and control a current of electricity in space.

Control is usually exercised by inserting a metal "grid" between filament and plate. The best way to understand the action of the grid is to look upon it as a Venetian blind. By applying a variable voltage to the grid we can let through as many or as few electrons as we like to the plate, the important point being that a very small change of voltage on the grid will produce a large change in the current of electrons. This is how the amplifier valves in your radio set work, and it is often the job of valves used in an electronic instrument to take a very weak current and bring it up to a strength which will operate a motor, relay or switch.

The electron tube is thus principally a "link," which takes power in one form and delivers it in another. The input may be only a weak signal, but at the output end there is nearly always a motor or other piece of electrical apparatus that does the actual job.

The photo-electric tube or "cell," on the other hand, does not have a hot filament. It depends for its operation on the fact that a beam of light will chase electrons out of certain metals, and since the brighter the light the more electrons are chased out, changes in the intensity of a light beam are thus converted into electric currents. The sound track on a cinematograph film acts in this way. It is composed of a sequence of

gradations of light and shade, to each of which the photo-cell responds with a different electrical impulse. These, fed to speakers behind the screen, produce the desired sounds.

Another type of valve which, besides being at the foundation of television and radio-location, is gaining in industrial importance, is the cathode ray tube. A simple tube would be constructed as follows. Source of electrons is a hot wire, the electrons emitted being attracted by a powerful charge on a circular plate some small distance away.

In the centre of this plate there is a pin-hole, thus allowing a thin pencil of the "rays" to penetrate it, from the other side of which they travel on in a straight line unless otherwise influenced. Cathode (filament) and anode (plate) are sealed into a glass envelope (highly evacuated) the bulbous end of which is coated with a fluorescent powder. The powder glows where the beam strikes it, the position of the beam being shown, therefore, as a luminous dot.

Sealed into the tube are also two sets of deflecting plates, one pair arranged horizontally, the other vertically. Suppose the first pair of plates is charged by an electric current. This has the effect of deflecting the beam up or down in a vertical sense, the amount of deflection depending on the strength of the charge on the plates, i.e., on the strength of the current which charges them. The second pair of plates, if charged, also deflect the beam, this time in a to and fro direction, i.e., horizontally. Hence the spot where the electron beam strikes the fluorescent screen can be manipulated anywhere on the fluorescent area.

Draws a Picture

Amongst other uses, to be mentioned in a subsequent article, the cathode ray tube can be used to show the instantaneous variations of a complex alternating current. The unknown current is applied to the first pair of plates and moves the beam up and down as it varies in strength and polarity.

An auxiliary current is applied to the second pair and causes the spot to move steadily sideways. Thus, through the phenomenon known as persistence of vision, the spot draws a picture of the exact wave-form of the unknown current and the amount of its vertical displacement measures the intensity of the current at intervals recorded by its horizontal position. This principle has important applications.

The valves mentioned so far are vacuum valves. All the air has been extracted from them for the reason that, apart from the fact that a red-hot filament would soon be oxidised if the bulb contained air, the presence of gas molecules would hinder the flight of the electrons owing to constant collisions.

However, certain valves nowadays do contain a certain amount of intentionally inserted gas (generally one of the inert or "lifeless" variety) the reason being that when a fast-

*The "satellite" electrons are referred to here. They can be forced from their orbits relatively easily. Dislodging them from the "nucleus" is a very different matter.

moving electron strikes such a molecule it may knock off an electron here and there. The number of free electrons in the space between filament and anode is therefore greatly increased and very substantial currents can be made to pass.

Amongst the most interesting of the newer gas-filled valves are those known as Thyratrons and Ignitrons. The importance of the Thyatron is that it will only pass current when the control current has built up to a certain value, but when it does pass current, the latter builds up to a very high value in a fraction of a second and is maintained just so long as the control current remains at its critical value.

The Ignitron, on the other hand can handle currents of hundreds of thousands of amperes at the voltages necessary in many industrial processes, such as electrolytic production of metals (magnesium and aluminium). The point is that *direct* current is required, but at these amperages it is more convenient to generate alternating current and to rectify it, but rectification on a big scale has always been an expensive and tricky business. Valve rectifiers solve this and many other problems. Ignitrons are diodes (two element valves). They need no grid.

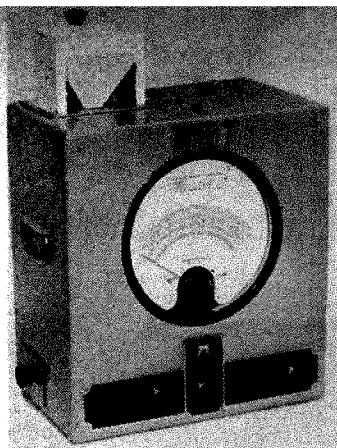
Penetrates Steel

In the smaller valves a filament is used as the source of electrons, but for those of really high power it is usually a pool of mercury. Such valves are usually started by a third electrode—not grid-shaped but equivalent to a grid in action so far as starting is concerned. And it is charged positively. This electrode, sometimes called an igniter, makes a rough contact with the surface of the mercury and sets up a small discharge current to itself, thus heating the mercury at the contact point and providing a source of electrons. The electrons that are freed stream towards the anode, knocking off electrons from gas molecules as they go.

The gas molecules that have lost electrons, on the other hand, are driven towards the mercury because, having lost an electron (negative charge) they are positively charged and are repelled by the anode. Striking the surface of the mercury with force they keep it hot and so maintain electron emission. The igniter, having done its work, can be switched off, the alternating current being connected to the anode. Naturally a current will only flow when the anode is made positive, i.e. during a half-cycle.

Another kind of electronic tube that should be mentioned is the industrial X-ray tube. In the X-ray tube electrons are produced by a special cathode analogous to the hot filament of the wireless valve, and are attracted to the "plate" or anode by a very powerful current, sometimes of the order of one million volts.

These accelerated electrons strike the anode with terrific force—so hard that they



Moisture in grain is detected and measured by the Mullard meter

almost shake the metal (which has to be water-cooled) to pieces. The atoms of the metal comprising the anode are thus put into a peculiar state of vibration and give off a radiation so powerful that it can go right through inches of steel, enabling faults, blow-holes and the like to be instantly detected.

Finally, a valve development which has owed much to intensive effort for war purposes is the production of *ultra-short* waves, a matter of considerable difficulty heretofore.

Connected in a suitable circuit, the ordinary three-electrode wireless valve can easily be made to generate an oscillating current, the period of oscillation depending on certain electrical factors in the circuit. The period can virtually be made as short as we like, but unfortunately the *power* behind the oscillations decreases as the wave-length associated with them gets shorter, i.e., as the frequency increases.

Valve developments associated with radar, however, have overcome this difficulty, and it is now possible to generate considerable power on very high-frequencies.

To summarise: the chief tools of the electronic engineer are the valve (used as detector, amplifier, rectifier or oscillator), the photocell and the cathode ray tube. In a subsequent article it is hoped to show how these may be integrated into apparatus for control, regulation, power conversion, counting, sorting, inspecting, measurement and calibration, heating and safety. It is also desirable that the reader should be introduced to one or two processes in which electronic apparatus is used in conjunction with other physical devices to perform operations previously impossible without damage to the actual goods. Typical of these most recent innovations is the development of molecular vibration apparatus.

On the Payroll—On the Job

Plan to cut indirects and put supernumeraries on the production line

By PETER DRYDEN

NOT a day passes but one hears the complaint that production, man-output, deliveries and the whole reconversion programme of firm after firm are seriously affected by shortage of materials and man-power.

As for the first, live managements know the world supply position; by research and wise substitution they are succeeding to some extent in reaching a fair solution, albeit it is temporary.

But there is no substitute for man-power—for brains, or for initiative. The machine, be it the latest word in scientific and engineering skill, remains an inanimate thing. Men must plan its use and then put the plan

ness man discover the position in his own set-up? Is there a formula to reveal organizational shortcomings and which could be applied effectively? I say that there is; Let us examine a case where the management discovering wanton waste took positive action. Let us look at that action in process and finally examine its achievement.

It all began with a simply worded, but unambiguous memorandum from a harrassed labour manager to his managing director. Not unaware of the position but knowing the urgency of the situation, the managing director decided on immediate action. His memorandum reproduced opposite might easily have been yours in a similar position. But

Works Indirects.			Administrative Indirects.			Commercial Indirects.		
		%			%			%
Inspection	...	16.0	Supervision	...	10.0	Wages	...	4.0
Progress	...	7.5	Process and Planning	...	3.0	Costs	...	6.0
Small Tools	...	3.0	Main Stores	...	5.0	Bonus	...	4.0
Truckers	...	8.0	Sub Stores	...	4.0	Sales	...	18.0
Shop Clerks	...	5.0	Canteen	...	8.0	Records	...	7.0
Maintenance	...	6.0				Secretarial	...	3.0
Cleaning	...	5.0				Publicity	...	10.5
						Purchasing	...	4.0

to work and have men to work it, and lack of man-power is more frequently alleged to be the stumbling block to productivity than any other single factor.

Perhaps there are not the men to go round, at least in sufficient numbers to justify a more optimistic managerial attitude. But time and again a careful survey in an organization has revealed a surprisingly prodigal waste of the man-power, brains and energy already on the pay-roll.

Today, no firm facing its reconversion and marketing problems can afford to have on its books people who do not make their full contribution to the total productive effort.

How can the anxious and harrassed busi-

ness man discover the position in his own set-up? Is there a formula to reveal organizational shortcomings and which could be applied effectively? I say that there is; Let us examine a case where the management discovering wanton waste took positive action. Let us look at that action in process and finally examine its achievement.

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what could happen and what did happen is the measure of the follow-through ability of a live management team.

This correspondence led to an executive survey and the results shown above.

First let us look at the preliminary results of these two memoranda.

The natural follow-on of this analysis was that each section had to undertake drastic alterations in order to secure a release of personnel for other work (in effect it was 1940 all over again). The labour office was charged with sorting out the recommendations made and undertaking:

(a) What labour could be persuaded to take up actual direct production processes.

MEMO TO: MANAGING DIRECTOR

16/12/45

FROM: LABOUR OFFICER

The wheels of re-organisation began to move when this note arrived at the M.D.'s Desk

You require another 6,000 hours per week to meet existing commitments. M.O.L. states impossible for increased labour allotment to be found. Have explored all avenues. Can only suggest overtime.

MEMO TO: WORKS MANAGER COPIES TO COMMERCIAL MANAGER,
PRODUCTION MANAGER.

FROM: MANAGING DIRECTOR'S OFFICE.

16/12/45

It is imperative that all steps be taken to increase production. I have examined the pay-roll and it would appear that we are carrying nearly 140% non productive labour. I want that % cut. I also want the proper real location of labour by directing it into positive channels.

The Managing Director got through three gears at once. Things began to move

(b) What labour could be transferred from the indirects to release other more suitable indirect workers for more productive work.

(c) To apply job rating to determine the requirements for each job.

(d) To apply job grading to suit these needs.

(e) To effect retraining to meet these needs.

Section by section the results of the re-
trenchment were tabulated thus:—

WORKS REORGANISATION OF INDIRECTS

(Production Manager).

(1) **Inspection.** Reduction from 16 per cent. to 5 per cent. (from 40 to 13 *).

Micrometers were being extensively used. Considerable time was saved by switching to snap gauges, GO and NO-GO plugs and o.d. gauges. This established the limits immediately without having to adjust the reading every time. Owing to a hangover from the war-time philosophy, limits had a tendency to be unduly tight, with the result that close accuracy threw up a large percentage of rejects, which of course involved much duplication of the inspection function. Therefore all limits except "force" and "running fits" were eased off. This cut rejects by 20 per cent., reduced re-operations by 42 per cent. and speeded up production.

Abeyance pools were created to absorb high and low limits for remating, instead of scrapping. Batching was cut out entirely and instead, floor inspection was substituted. This reduced the load on the view room.

Quality control was thus instituted which

prevented qualitative deterioration on quantitative runs.

(2) **Progress.** Reduction from 7.5 per cent. to 4 per cent. (from 19 to 10 *).

This was accomplished by streamlining the control system, progressing only as far as the main stores (working line-feeders collecting) and increasing delivery batches. This cut the paper work required in half. Goods inwards took over the material control records and routed the flow against the copy of the layout and part number. Bulk was used to prevent idle or waiting time and thus relieve the progress dept. Route cards were issued via the purchasing department so that they could instruct appropriate delivery centres.

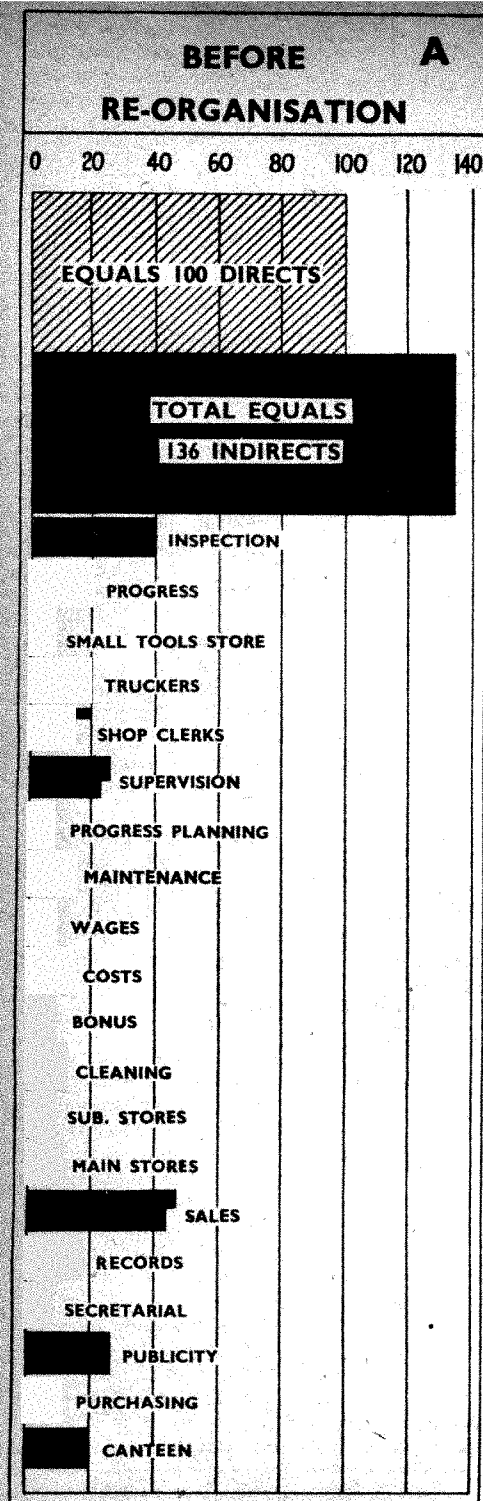
(3) **Small Tools Control.** From 3 per cent. to zero (7 *).

After use, the control used to transfer the small tools to the tool room for resetting, sharpening and checking. They were then passed through the store for records and abeyance. This involved double handling by the truckers and two lots of records. By holding them in the toolroom store, and making that storekeeper responsible for their care, the small tool control just disappeared. Floor space, paper work, trucking and personnel were all saved.

(4) **Truckers.** From 8 per cent. to 4 per cent. (20 to 10).

The provision of 1,700 feet of roller conveyors, each machine and assembly aisle having its own length running to a collection point saved both time and energy. Because

NOTE.—* indicates taken to nearest whole.



the parts had already been inspected off the machine or bench, routing directly was achieved, thus saving time, progressing and trucking labour.

(5) **Shop Clerks.** From 5 per cent. to zero (12).

This function was mostly concerned with the issue of job cards and booking time. The issue of job cards was given to the progress clerk, the charge hand collecting in bulk for each day's work. In each shop, the door-keeper was in charge of the clock and responsible for checking pass-outs. Accordingly to him was given the job of time recording for the job cards. By adopting the principle of job numbers it was easy automatically to record the idle and waiting time and the chargehands were responsible for compiling the group charges and changes. This by means of operator transfer slips dropped into appropriate collection boxes. In effect the shop clerks disappeared as a function and reinforced the progress clerks where indicated.

(6) **Maintenance.** From 6 per cent. to 4 per cent (15 to 10).

This department had been held at peak strength. Accordingly the survey demonstrated that the percentage of saving was more due to hidden redundancy than to

**To reverse that ominous, heavy black bar,
that was the job management set itself**

practical economies. By making each fitter record his job times it was demonstrably exposed that much time was being wasted. Another facet thrown up was that as new machine tools had been brought into use so the need for reduced maintenance charges was not exploited. Originally each section had its own maintenance staff. By creating a central pool and calling on and off by means of priorities, a considerable saving was effected. Portable mechanical equipment was provided to prevent small cutting jobs having to go back to the fitting shop.

(7) **Cleaning.** From 5 per cent. to 3 per cent. (13 to 8*).

This reduction was accomplished by installing vacuum extractors and polishers. Rotary mops for large area sweeping also helped. Combination broom and spray for "dustless" operations cut down the care required . . . and the number of cleaners. Swarf segregation in each bay helped as did separate bins for waste and debris. This kept the floor clear for mechanical cleaning. Another important factor was that at breaks, each operator had to place the stool, chair or body support clear of the floor, on the bench or foot rack. This enabled avenue cleaning to be done expeditiously.

ADMINISTRATIVE REORGANISATION

(Works Manager).

- (1) **Supervision.** From 10 per cent. to 7 per cent. (25 to 11 *).

The overall shrinkage of the war programme with its retrenchment on staff policy, had left the supervision problem as it was, with the result that being overloaded, management was faced with a ticklish problem, since the majority of the junior supervision had been upgraded.

The first stage was to evaluate the respective departmental responsibilities and commitments. It was clear that gross overloading was being carried and accordingly those selected for down grading were given a full explanation and offered a long notice if they preferred. Two took up the option. The others were down graded into working chargehands; the salary situation was handled by offering an efficiency bonus based on enhanced departmental output. The second stage was to load up the responsibilities of the remainder so that the work was more equitably distributed.

- (2) **Process and Planning.** No change. Production economies start at the drawing board and to economise on processing might prove more costly than the economies.

Proof of Achievement, Directs went up and indirect non-productive costs slumped

- (3) **Main Stores.** No actual personnel economies were here effected. The basis for improvement was that of increasing load. The sub-stores were entirely absorbed and the main stores moved to a more strategic position. The new centralisation of the stores meant a relief in the trucking, more easily controlled issues and a cut back of the sub-stores by ten workers.

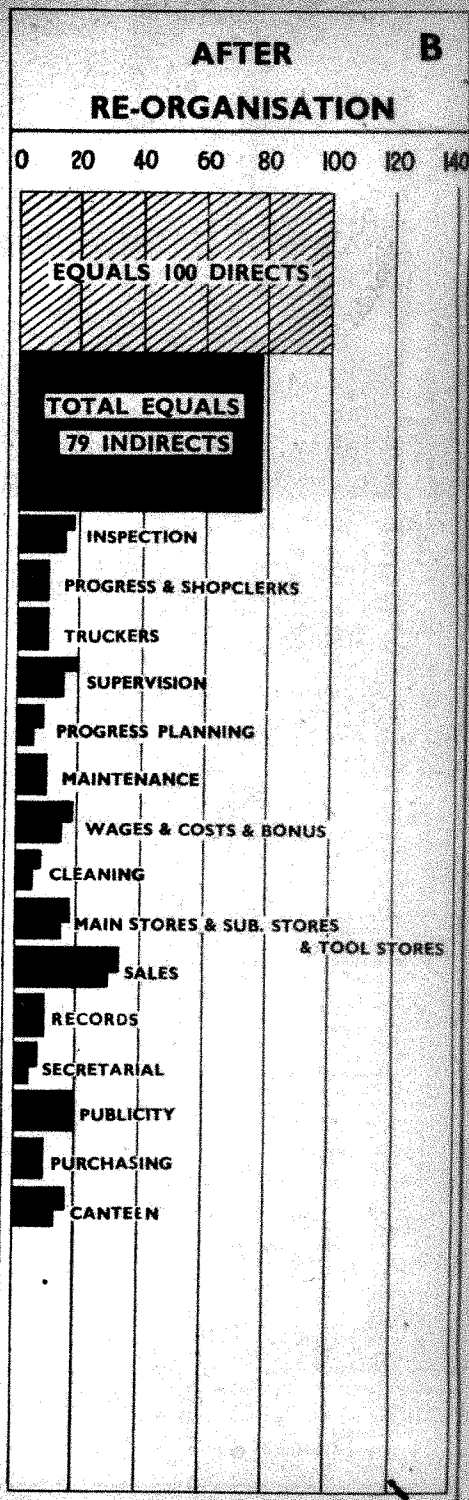
- (4) **Canteen.** From 8 per cent. to 6 per cent. (from 20 to 15).

The major economies were made by instituting ticket machines to save handling money, self-help counters relieved service, the return by customers of soiled utensils saved labour and beverage service from mobile trolleys cut supervision of hatch serving. Finally, staggering of breaks relieved the personnel.

COMMERCIAL RE-ORGANISATION

(Commercial Manager).

- (1) **Wages/Costs/Bonus.** These three functions, utilised altogether 34 clerks. Being functionally separated, yet having to work in close liaison much of the work associated with each department was being triplicated, the same sets of figures were being produced, the same sources of information were





"But There May Be Snags"

THE situation Mr. Dryden describes is all too common in industry today. Supplementing the Dryden plan, Reginald W. Fry of Murphy Radio and BUSINESS Executives' Brains Trust, urges a national drive along the lines of the Dryden plan.

Each company, however, must not regard Mr. Dryden's programme as of parallel application. R. W. Fry indicates the snags to be encountered in applying it and offers a check calibration against Mr. Dryden's yardstick.

Says REGINALD W. FRY

THE value of Mr. Dryden's article lies in pointing out a situation that can be true of any concern in the country today; the situation of inflated overhead personnel. Further Mr. Dryden has by a specific case indicated the extent to which overhead personnel may have been inflated during the war years.

Prior to the overhead survey, if my deductions from his figures are correct, this concern had 250 production operators and an overhead staff numbering some 350 people. The re-organisation saved 155 overhead employees; production capacity increased by 34%.

This, as I see it, means that either the whole of the redundant overhead staff were transferred to production and are working at an efficiency of about 55%, or about 85 of the redundant overheads opted for production work.

Assuming the latter to be the most likely—although in my experience this firm has been fortunate in such a high percentage of mixed overhead staff choosing production work in the face of the demand for overhead personnel which exists today—this situation must be very common in industry today, and I think that a National drive along these lines would, to some very considerable extent, solve the immediate and long term problem of labour shortage.

So much from the National point of view. Looked at from the Company's operating results their turnover should have increased by somewhere about a third and their lower overhead labour bill will have the effect of reducing the labour overhead charge to direct labour by a half.

Nevertheless, I feel that I ought to point out that this is a case history of a particular concern, and although I believe similar conditions exist in many firms in industry today, we must not conclude that there is an exact parallel as regards the nature, the extent of, or the remedies for the particular case of overhead inflation.

My point is that the Departmental numbers before and after the re-organisation of this concern cannot have other than a coincidental significance for any other concern, neither should the measures suggested be considered as anything other than an incomplete check list.

It would perhaps be as well to supplement Mr. Dryden's case material by pointing out the "laws" of any overhead reduction. By that I mean the processes which have to be gone through in order to achieve the maximum economic effectiveness from overhead expenditure.

First: Minimum overhead expenditure and maximum overhead efficiency from overhead departments are, as a general rule, in direct relationship to what is known about expenditure.

For example, it is not very easy to do very much about reducing say an item in the accounts

of several hundreds or thousands of pounds for consumable stores, the responsibility for which may be spread over several departmental heads.

But if we take the extreme of challenging every item in that account then it is fairly obvious that considerable reductions will be achieved.

Second: And this is really a corollary to the first point. Someone sitting in an office, whether he is called a Budgetary Controller or a Departmental Manager, cannot control expenditure.

The place to control expenditure is where it is spent, and the implications of this principle are that every supervisor, however far down the scale he may be, should have a budget, should have the authority, and should be held accountable for meeting his budget expenditure.

It is only thus that cost consciousness is created throughout an organisation, and it is this attitude within an organisation which is far more effective in controlling expenditure than all the pieces of budget paper.

Third: Budgets are not once a year jobs. In moments of rashness I have made a statement that unless expenditure has been brought under detailed investigation within six months by a qualified person I would guarantee to reduce that expenditure by 15 to 25%, without harming the efficiency of the overhead service.

I have been challenged and proved wrong on a number of occasions, but not nearly so many times that my statement has been proved to be true.

Fourth: Wherever a situation has arisen which demands an overhead "slaughter", there must be a top level co-ordination plus authority, otherwise one finds unevenness in the sacrifices that are made by the various departments concerned, and quite frequently the policy of firms unwittingly changed by the separate interpretations of the instruction for overhead reductions.

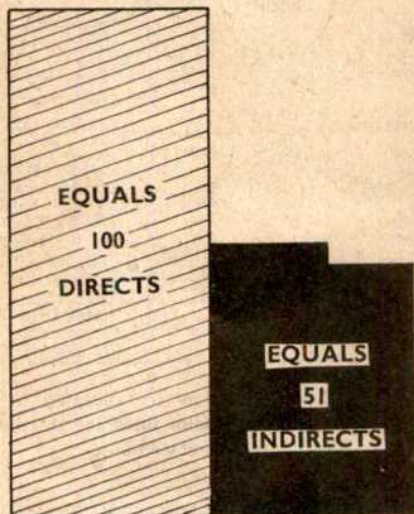
Fifth: Reverting to Mr. Dryden's case, I would have preferred to have seen a memorandum instructing the top Executives to make budget reductions set a target.

Sixth: In most organisations there is a place for a Budget officer, not with authority to reduce expenditure or to suggest departmental budgets, but to co-ordinate the overhead expenditure of all departments to a budget which provides integrating overhead services within the profit and loss possibilities of the concern, and such an official should endeavour to spread the technique of his profession among those people who actually control the expenditure.

Further, some part of his time should be spent with the ever present and never properly solved problem of the measurement of what is the right amount of overheads to be spent by each department and function.



FINAL STAGE C



FORMULA

(On 250 Indirects)

A=340 Indirects

B=198 "

A-B=142 Release for Production Work

Add 142 & 250 & the Total direct labour

=392

But in this figure, 198 Indirects becomes

Only 51%

being used, so the logical development was to merge. By so doing a comptometer pool was created, the filing and data development was made uniform and time was saved in phones, messages, transfer of information and the final clean-up resulted in cutting from 34 to 15 clerks.

(2) Sales. From 18 per cent. to 11 per cent. (45 to 27*).

This had been a department that had suffered from precipitous planning. The recovery programme not having been attained, there was for the time being a surfeit of the field force.

In fact it could be said, that as it was impossible to supply the dealers with the quota required or expected, the maintenance of such a large force was not only uneconomic but in fact tended to depress goodwill; the mere fact that calls were being made implied that a supply was forthcoming, with consequent disappointment.

Secretarial. No change.

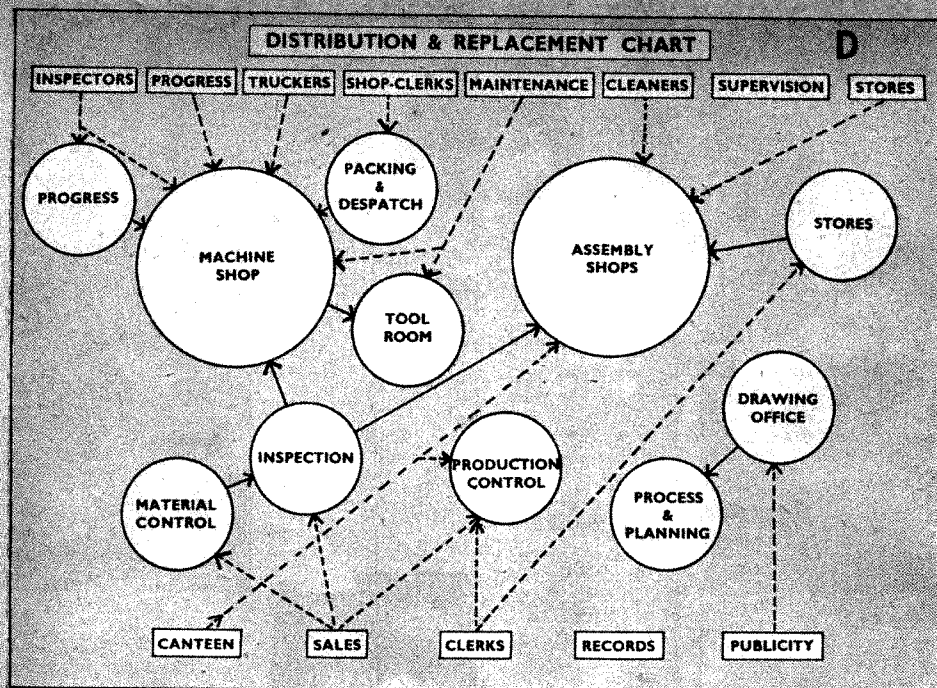
Publicity. From 10 per cent. to 5 per cent.

(from 25 to 12*).

This was in much the same position as the sales dept. Re-conversion not having come up to expectations, some pruning was considered desirable. The top ideas men were held, but the routine copy and artists personnel were cut back. In any case, it was considered desirable that the mechanics of publicity should be handled by an agency.

Purchasing. No change, in fact there was slight increase here (from the sales department) because material supply still required considerable pressure.

Conclusion.—As the relevant personnel became available they were passed on to the labour office. The fruits of that first memorandum were ripening within a month. A redistribution of force had now become a practical possibility. There were instances in which existing departments were temporarily reinforced so that future releases of more suitable personnel could be made for transfer to more productive work. The



At a glance, the measures of Re-organisation are revealed in an examination of the Distribution and Replacement programme. Solid lines are transferred people; the dotted flow lines—Replacements

distribution chart shows how this was done.

Where rates of pay were endangered special easement scales were instituted to protect staff and operatives during training and development periods. The experiment it must be admitted bears the hallmark of success.

The figures showed a 34 per cent. total

increase in productive capacity, and in times when the competitive spirit is slowly emerging, the £2,800 of monthly economy on the pay-roll saved from indirects, can quite easily be the difference between a programme of successful manufacture, selling and distribution, and an irretrievable loss on the year's working.

Bringing the Post Room Up-to-Date:

The 'U' Assembly Line

IN many offices mail-handling methods are obsolete. A large or special mail may delay the start of office work for an hour or more after the business opens, and often at the end of the day there is a frantic rush to get the letters out.

A well-planned mailing room, plus a definite procedure for handling the post, can eliminate confusion, wasted time and costly errors. No one business has the same problems, but there are certain fundamental requirements common to all.

We know of more than one large concern where it has been found profitable to have the post-room employees report for duty half-

an-hour earlier than the rest, and to leave half-an-hour later in the evening.

Typical example of an efficient mailing-room arrangement is one where all the equipment is organised in a U-shaped assembly line with large sorting tables in the centre. Incoming mail is placed on the centre tables, and until preliminary sorting is completed none but the sorters have access to it. After sorting, the mail is opened, time-stamped, and placed in metal trays marked according to its destined department. A strict timetable is kept for deliveries to departments and for pick-up of outgoing mail.

Whether the office be large or small, system is vital.

British Industry Turns on Jewels



Nature's Process Speeded by
Chemists Producing Synthetic
Sapphires for Precision Engineers

By ROBERT W. HUNTER

SEARCH all Britain and it would be hard, if not well nigh impossible, to find an industry so replete with paradoxes as Britain's new war-born industry of sapphire production. Here sparkling romance and stern hard reality, natural born enemies, go hand in hand. Rejects may become gems of great intrinsic value, and waste is in good demand.

A flawless one hundred and fifty carat sapphire, capable of passing the most rigid factory inspection, which would be worth a fortune if it exhibited natural flaws in its texture, is worth but a mere pound or two. A connoisseur visiting the factory would cast aside as artificial a skilfully cut gem of brilliant lustre because of its purity and perfection. And, paradoxically, the intense heat of about 2,000 degrees centigrade needed to produce the sapphire is harnessed out of the energy contained in ice-cold water drawn from the Cumberland hills.

We visited the Lancashire factory—its location once a well-hidden secret—where this new vital industry of producing synthe-

tic sapphires and rubies, is in being. In a small plain brick-walled room in a one-time cotton mill, we watched through smoked glasses a sapphire being born out of a few specks of whitish powder, and grow gradually into a white sapphire about $2\frac{1}{2}$ ins. by $\frac{1}{4}$ in., weighing nearly three hundred carats. In five hours was completed a process which takes nature many thousand years, and the product was chemically purer than the product of nature herself.

In an early war year, unless a quick decision had been made by high government officials, unless a large industrial organisation had planned production of sapphires in Britain, unless a Lancashire business man had run the gauntlet of German vigilance in a dangerous journey from Switzerland across France by train and taxi, and on foot, to a warship in Bordeaux harbour, conveying vital parts of one of the most intricate machines concealed in his luggage, Britain's plight might have been graver, and the tale of the war might have been told differently.

For, the might of battleships, merchantmen, bombers, fighters, gun batteries, and tanks, and certain radio activities and war industries, turned on an adequate supply of tiny jewel bearings. And any ship bearing diamonds, sapphires, or rubies, to Britain would have been a No. 1 priority target for the enemy.

Already, within a year of the end of the war, the synthetic sapphire industry is playing an important part in the development of certain branches of post-war industry, and in the building up of the advancing total of export trade, and in conserving funds by the reduction of imports.

The present outlets of the synthetic sapphire industry for its product are in the field of light and scientific industry, and in the export of jewel bearings. A potential market of the future lies in the luxury jewel trade.

The Uses of Jewels

To the precision engineer there is no substitute for a jewelled bearing in a vital instrument. Where forces are small there must be a minimum of friction in the pointer or indicator bearings in the interests of the achievement of accuracy.

Particularly where climatic conditions and variation of temperatures affect precision measurement instruments, jewelled bearings, which remain unaffected, are vital. The technically ideal frictionless non-variable bearing is the diamond, which however cannot be made satisfactorily by synthetic methods. Next in the scale of hardness come sapphires and rubies. Even in every household and factory the electricity meter has a jewelled bearing.

The present vast modern array of precision and other scientific instruments, being manufactured in Britain for home use and export, requires an enormous quantity of jewel bearings. We do not indulge in a flight of fancy when we say that British aeroplane services at home and overseas fly on jewels. Nor, are we off the track, colloquially-speaking or from a marine point of view, when we remark that every skipper who does not sail "By Guess and By God," makes port on a diamond or a sapphire, for in every ship's compass housing are a few shillings worth of tiny jewel bearings.

The fate of an expensive overseas air liner, its passengers, cargo, and crew, depends on compasses, altimeters, oil, petrol and water gauges, artificial horizons, temperature and speed indicators, radio instruments and other devices, each of which employs jewel bearings.

In many military aircraft there are upwards of a hundred instruments, including gunfire control instruments, which turn on synthetic sapphire bearings.

In the interests of the protection and development of Britain's new synthetic sapphire industry, vital figures of production and consumption must remain secret.

We venture to suggest, however, that the nautical instrument and aeroplane instrument industries, both in home trade (which includes shipbuilding and aeroplane manufacture in British yards and factories), and in the export trade in such instruments, can consume vast quantities of British-made synthetic sapphire bearings.

Electrical equipment manufacture and scientific instrument production; power station switchboards and boiler house panels; protective relays, generator cables; railway electrical signalling; sapphire knife edges on balances, replacing the softer agate used; gramophone needles; and glass-cutting tools — form other industrial uses for the sapphires. The bearings are sometimes as small as one millimetre in size. The export trade in these industries, including contracts for overseas power house construction, reflects itself in the sapphire industry.

It is a far cry from nature's black diamond — coal, to sapphires, emeralds and rubies, yet coal utilisation and consumption policy will be directly related to sapphires. To the extent that coal ceases to be used in its raw state in industry and railways, and the energy and heat is obtained by means of electricity, the use of sapphires will increase in view of the great importance of synthetic jewel bearings to the electrical instrument industry.

The Markets are Great

Experimental manufacture and tests of a satisfactory nature to date have been conducted in the field of sapphire ball bearings.

Reference was made in the March issue of *BUSINESS* to the utilisation of synthetic rubies in the manufacture of high grade watches. Approximately eight million watches were imported annually pre-war, of which about seven-and-a-half were of the popular type of timepiece. Electric clocks were becoming increasingly popular in the domestic and commercial world, and were being exported from Britain to many other countries.

To-day the world demand for British-made watches and clocks is extremely high and plants are exerting every effort to meet this demand. The successful development of the clock and watch industry will reflect itself in the synthetic gem industry.



A quick tap with the hammer splits the sapphire lengthways before it is sawn into the strips from which the instrument jewels are made

Split sapphires from the furnace are cut into quarter-inch cubes. Then they are ground, drilled and polished into the finished jewel

For industrial purposes, flaws are inadmissible. The chief chemist checks newly-made sapphires which have been split, numbered and weighed prior to cutting

[Photographs taken in a G.E.C. factory in Lancashire]

Even into the realms of the humble yet powerful vitamin world synthetic jewels enter. We encountered Vitamin A estimators being manufactured employing these tiny gems. In the manufacture of photographic apparatus the synthetic stones are found in the photo-electric light exposure meters. Vibration analyser instruments employ them. Much more than is perhaps realised, British industry turns on jewels.

What is the potential market in the luxury jewellery trade for synthetic sapphires, rubies and emeralds? When austerity conditions eventually end the pendulum is likely to swing to the other extreme. It is a reasonable assumption that repression will be replaced by individual self-expression, that the reaction from the dullness and drabness of living conditions will be colour and brightness, that the feminine world, provided with an adequate supply of new clothes, will desire greater personal adornment in the shape of jewellery.

A boom in jewellery is not unlikely. The mass will not be able to afford the highly expensive natural precious gems of the first rank, and will be content with the synthetic stones of such category.

Here let us say that the "synthetic" sapphires are not *ersatz* or "artificial" gems, and the same applies to the rubies and emeralds. They are real stones of the same chemical composition as the natural gems, but chemically purer. The synthetic colourless or "white" sapphire is composed of very pure aluminium oxide, which is nature's chemical formula.

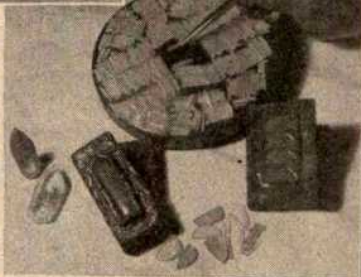
The synthetic ruby, another form of sapphire, contains a considerable proportion of chromium oxide, also nature's formula. The colour of the blue sapphire may be pro-

duced by adding such as iron and titanium oxides to the aluminium oxide base. In the case of the "oriental emerald" iron alone is the colouring medium.

In the process of synthetic sapphire manufacture which we saw at the Lancashire factory, the requisite chemical powder, aluminium oxide, is fed to the furnace in recurrent small quantities, and is fused by the 2,000 degree centigrade heat obtained from an oxy-hydrogen "blowpipe" flame, the oxygen and hydrogen gases having been obtained from the chemical constituents of ordinary water.

The sapphire boule "grows" upwards from an original tiny spherical globule. After the sapphire boule has reached the requisite size of about 50-60 mm. in length, 20-25 mm. in diameter and 300 carats in weight, and has cooled, it is split into roughly symmetrical halves by a sharp blow on the stem.

The sapphire halves are then cut and pro-





A sapphire is born. From a few specks of powder, grows a white sapphire weighing nearly three hundred carats. Furnaces complete in five hours, a process which takes nature many thousands of years

ports and import funds is the intensive development of the precision and scientific instrument, and of the watch and clock-making industries within Britain. In Switzerland, of course, plants are intact.

Regarding other potential world competition in any export of synthetic jewel bearings, in U.S.S.R. experimental work was commenced in a small way in 1928, and an

cessed into the required gem sizes and form, by tools and equipment tipped or edged with the much harder diamond-impregnated dust. Sapphire dust and ground waste, coming next in category of hardness to the diamond, is of value in cutting materials of lesser hardness and as an abrasive.

Before the war, the production of synthetic gems had grown to very large proportions, principally near the location of the watch-making industry, for millions of jewels annually are used in watch manufacture.

The chief centres of production were in Switzerland, Germany and France. Some of the factories had several hundred furnaces with an estimated aggregate total daily output of between 750,000 and 1,000,000 carats, or roughly four hundredweights of gems per day! Such included a proportion of jewels for decorative purpose, including spinel, a rather softer stone.

Information is not yet available as to the extent of war damage to German and French plants, but healthy purchase enquiries from the continent to the British sapphire plant would indicate that production of such plants has at the very least been substantially diminished. But a material factor from a national point of view as regards im-

extensive investigation was initiated four years before the war, but, according to 1944 information—the last available—success had not been achieved in size of sapphire boules. In the American technical Press, sapphires have been offered for industrial purposes, for the working surfaces of mechanical dimension gauges, instrument jewels, tips for tools, etc.

In the field of jewellery, technical methods may some day be discovered to create "natural flaws," and a factory craftsman may, by deft feeding of chemical constituents, produce tricoloured sapphires and the colour variations and tints to be found in many natural stones. But whether or not qualities of phosphorescence and the inherent power to develop and retain positive electricity are ever attained in the synthetic ruby, the X-ray will continue to distinguish between the synthetic and natural gems.

While the production of synthetic diamonds (pure carbon) was recently reported in the Press to be "just round the corner," the technical problems and high cost of production of such, would still leave the fields of industry and jewellery to synthetic sapphires, rubies, and emeralds, the next hardest rank.

LOOK-OUT *for* NEW IDEAS



● **Fat Catcher.**—A Scotsman has invented a device for use in conjunction with gas, electric and oil cookers which is designed to catch hot vapour or grease laden gases and air which would otherwise accumulate in the kitchen. It consists of a box arrangement which, resting on the top of the cooker, traps the gases and conserves heat. The box is open at the front and, of course, at the base, so that cooking can be carried on while it is attached.

ment, which might cause binding. Mechanisms at present in use all require manual adjustment—a matter of difficulty for owner drivers and others lacking special skill.

● **Talking Poisons.**—Poisons can be made to “talk” as they pass through the body by means of a new process discovered by U.S. scientists. The poisons are first made radioactive by baking in an atomic oven. The radiations can then be turned into sounds which show their positions as they pass through the body. The technique enables scientists to tell what happens to the molecules of any chemical when heated, frozen or subject to stress and strain.

● **Sound Proposition.**—London Transport has commenced work at both ends of the Central Line—a 23 mile extension to Stratford, Leyton and Ongar in the east and from North Acton to Ruislip in the west. A special feature of these new lines will be the elimination of noise by the welding of rail joints over lengths of 300 feet instead of 60 feet, as in the past. In addition, the whole line will be asbestos sound-proofed.

● **Wire Watcher.**—Trailing cables, such as are used in mines, are liable to break as a result of the wires snapping a few at a time. When this happens the open circuit inside the rubber casing may cause burning and more or less serious results. Such disasters may be prevented by using a new apparatus which indicates when some of the wires are broken in a cable and well before the complete fracture takes place.

● **Pot Luck.**—Better coffee results from using a sealed pot, just patented in this country, in which the bottom part contains a number of projections to take heat from the heating element to the coffee. A sealed lid equipped with safety valve enables the temperature to be varied, and the container may also be provided with fins so that when allowed to cool after the valve has functioned a vacuum is produced and further extraction takes place from the beans.

● **Cuts Costs.**—Residue petroleum, made from burnt asphalt, a waste product for which there has been in the past no market, may now be used as fuel in ocean-going motor ships. This and further developments may result in gigantic reductions in the cost of operating motor ships.

● **Cold Comfort.**—Tuberculosis, infantile paralysis and the common cold may soon be under practical control, according to the American inventor of the new wonder drug, streptomycin. Meanwhile, two young scientists from Milan claim to have produced something even more powerful than penicillin.

● **For the Surgeon.**—A method has been evolved in America of sterilising surgical instruments without using steam, hot air or boiling water. The instruments are treated with a new composition containing a solution of a sterilizing agent in a non-volatile, physiologically harmless liquid. The invention is applicable to surgical instruments generally, and especially to hypodermic needles and other instruments which are introduced into the tissues of the body.

● **Break for Brakes.**—Motor driving may become safer and easier if manufacturers adopt a new self-adjusting mechanism for hydraulically actuated brakes which will automatically compensate for wearing down of the brake linings whilst avoiding over adjust-

● **Plastic Boat.**—The first all-plastic sailing boat has made its appearance on the Thames. Made of welded “skins” of plywood, rather after the style of some aircraft, it has an alloy mast. Full-scale production of the boat begins in the autumn.

“Develop the Workers’ Faith in Management”

James F. Lincoln

Business Calling . . .

Quotes the Policies of Men Planning Britain's Prosperity

SIR WALTER WOMERSLEY

Praise for Small Traders



COMMENTING on Sir Stafford Cripps' allegation that too much labour is used in distribution, the Rt. Hon. Sir Walter Womersley, president of the National Chamber of Trade, declares:

"The small shops of Britain are not just a survival from the past; they are part of the living organisation of our whole economic life, from the production of goods in the factory to the consumption of goods in the home. Dispersed as they are, these shops serve the public in a different way from those in the large centres—by their proximity to consumers, by their personal attention, individual service and enterprise, coupled with their trade knowledge and advice.

"Efficiency in distribution is not determined according to the size of the unit, but is capable of achievement by all units whether large or small, and I would take this opportunity of urging all traders to make it their main task to develop their respective businesses as economic services which will retain for them the good will of a discriminating public."

Mr. J. WILLCOCKS

Wanted—More Ships



TO achieve the Government's export plans Great Britain should have a powerful mercantile marine, backed by a strong shipbuilding industry with which no other country could compare, states Mr. J. Willcocks, general secretary of the Ship Constructors' and Shipwrights' Society of Newcastle-on-Tyne.

"Machines, locomotives, electrical gear, housing components, and so on are urgently required," he states, "and the engineering industry must be efficiently equipped to provide their requirements

and to meet the country's needs to establish an ever increasing volume of exports.

"We want a properly planned industry, with manpower budgets set out, with proper distribution of plants, and the development of the location of industry, in co-ordination with the unions as the democratic voice of the workers concerned."

SIR MILES THOMAS

Let's Get Together



REBUKING those who, on both the managerial and the labour sides of industry are making political capital of present difficulties in this country, Sir Miles Thomas, vice chairman of the Nuffield Organisation, says: "I believe that much of the discontent and apparent ineffectiveness in the world today is the result of the outpourings of people

who seem to have a vested interest in political discord.

"We shall be helping to play Hitler's game," he goes on, "if we do not approach our problems in the same spirit of understanding that we showed in beating him. Any automatic line-up of employers and employees everywhere, one against the other and irrespective of the real problems at issue, would add nothing to global necessities and their amelioration.

"Fully ninety per cent. of the problems facing the world at the moment are economic, and only economic solutions will ease them. This demands repeated emphasis."

LORD DUDLEY GORDON

The Meaning of P.M.H.

PM.H., the topic of the hour in industry, is referred to by Lord Dudley Gordon, the chairman, in his speech at the annual general meeting of Hadfields, Ltd. He says: "It has been made perfectly clear that unless there is an increased production above the present rate per man hour our national economic position will remain completely unbalanced, resulting inevitably in a fall in the standard of living.

"This increased production per man hour does not necessarily involve increased physical effort, but it does mean that every hour

spent in the factory must be fully employed and that this shall be encouraged by the provision of machinery and equipment which will assist in raising the rate of production. For some years to come there should be a sufficient demand to ensure full employment so that 'fear of the sack' will not be a spur to increased effort.

"To put it the other way round, workers need not fear that by increased production they will be making themselves redundant. Our object is to achieve greater production with the same number of workers rather than the same production with fewer workers. Our plans include not only the provision of new equipment and machinery and improved lay-out to give a more even flow of production, but also improved amenities in the shape of more efficient heating, ventilation, and lighting of the shops and better washing facilities."

SIR A. STEVEN BILSLAND *Give Us Incentives*



SIR A. Steven Bilsland, Bt., M.C., D.L., chairman of the Union Bank of Scotland Ltd., states that the most disturbing fact in the whole trend of social and economic development is the complete silence on the part of the Government as to what incentive or sanctions are to operate to encourage or require the citizens to work, and to work earnestly.

A mere change in ownership or control, he believes, gives no promise, still less a guarantee, of more output per manhour, which is the key to material advance and contentment. The withdrawal of the excess profits tax at the end of the year was a welcome relief. If we are to avoid a rigidity of costs which would impede our progress in world markets when the period of the sellers' market concludes, earnest thought must be given to the means to reduce national expenditure.

Mr. JOHN GOODENDAY *Trust In Me*

A STRONG plea for the solution of the problem of absenteeism among young workers in South Wales by local education authorities advising and instructing the young people to trust their employers has been made by Mr. John Goodenday, managing director of Kayser-Bondor. He says that unless there is mutual confidence between management and labour, a progressive business cannot attain prosperity and workers cannot obtain the maximum benefit from the industry which employs them.

"It should be widely recognised that the time has gone when the employers could exploit their workers. The majority of indus-

trialists today are humanitarian, and they also believe that it is good business to have their factories filled with well-paid, well-fed, and contented workers."

Kayser-Bondor have large factories at Dowlais and Pentrebach.

Mr. H. H. HARLEY

Results of an Exhibition



COVENTRY Gauge and Tool Company Ltd., recently held an exhibition at their works of some of their more recent products. Mr. H. H. Harley, C.B.E., chairman of the company, describing the exhibition and the results it obtained, says:

"This exhibition was visited by upwards of 3,000 persons including overseas visitors, Govern-

ment departmental personnel, representatives of most of the great industrial organisations, and a large number of orders have been booked as a direct result of the exhibition."

Mr. Harley says that his company is fully prepared for any expansion of trade, both in the home and overseas markets, and adds: "We are fully alive to the possibilities of this expansion, and one of the objects of our exhibition at the works was to discover from our overseas friends what they really needed and whether we could get a lead from them as to their requirements."

Mr. IVOR COOPER *The Value of BETRO*



THAT there is still a vital need for a wider and fuller appreciation of the nature and functions of market research and all that term implies, is pointed out by Mr. Ivor Cooper, chairman of the council of the British Export Trade Research Organisation.

"Research," he declares, "may not at present be needed everywhere to sell

goods today, but its planning, the analysis of results and the building up of the resulting marketing policy, all take time. To meet competitive problems of two or three years hence, initial preparation must be started now."

Mr. Cooper points out that the Board of Trade are wholeheartedly behind BETRO, and that a joint standing committee of the B.O.T., BETRO and the F.B.I. has been set up. He claims that at the end of one year's work, BETRO had provided the country with a unique organisation for market research abroad.

C. J. NEWBOLD,
D.S.O.

Managing Director
A. Guinness, Son &
Co. Ltd.



Brought Fame to Famous Guinness

By ELIZABETH EWING

TO have launched the most popular and probably the best-known of all the advertising campaigns of our times from the very stronghold of a company which previously didn't believe in publicity of any kind and without it had risen to being the biggest brewery in the world, is a typical episode in the life of Mr. C. J. Newbold, D.S.O., Managing Director of Arthur Guinness, Son and Company, Ltd., since 1941, and Chairman of the Brewers' Society from 1942-45. Some Guinness officials had doubts as to the wisdom of this step when the campaign was started in 1928, but they soon realised that to advertise Guinness was good for them.

Looking back over events since he joined the company in August, 1903, Mr. Newbold finds mental enjoyment in a number of paradoxical facts of this sort. The most outstanding of them is that Guinness, unlike other breweries, do not own licensed houses.

Their beer is sold by their rivals on public demand. The greatest of all proofs of its goodness and the advertisement that speaks for itself is the universality with which these rivals market it. And as the maximum annual sales on record amount to 115,442,340 gallons and the one-day record to 632,164 gallons, that means something.

As an appendage to this there is the fact that while most breweries manufacture about ten different types of beer, Guinness's make only one for public consumption in this country—Extra Stout. Apart from that only two others are produced, a small quantity of draught porter for Eire and an export type suited to varied climates.

Although the Guinness family started the business in Dublin about 200 years ago, and there is a superstition (quite erroneous) that the murky waters of the Liffey contribute some magic elixir to their product, the pre-

sent company is, again surprisingly, an English one.

It was founded in 1886, when the Guinnesses sold their concern to the public for £6,000,000. The active family connection was, however, retained. The present Chairman, Lord Iveagh, who represents the seventh generation associated with the firm, attends the brewery regularly and follows its interests closely, as do the Hon. A. E. Guinness, Vice-Chairman, and Lord Moyné, who is a Director. In Mr. Newbold's opinion, this continuous family connection is a vital factor in the success of the company.

The London Brewery, which rises like a fortress at Park Royal, is the headquarters and administrative centre of the whole organisation, though there is the other larger and older brewery in Dublin, where the St. James's Well, a beautiful limestone spring 20 miles from Dublin, provides the necessary water for brewing. Park Royal is the only big really modern brewery in this country and one of the largest brewery buildings in the world. Built from 1933-36, it had Sir Giles Gilbert Scott as architect. It and the Battersea Power Station are the only factories illustrated in the County of London Plan prepared for the L.C.C. by J. H. Forshaw and Sir Patrick Abercrombie in 1943, and it figures there as a model of what a factory should be.

A Sportsman Too

That is one of the things that pleases Mr. Newbold most. It accords with his standards of business and of living. It lines up with an integrity and soundness, a solid connoisseurship, which characterise him and extend over his wide and eminently human business administration as well as his private interests. He is a full man, a ready man and an exact man in the humanistic sense in which Bacon used the phrases—a man with a spaciousness in his mind and his interests, and the power to communicate these qualities to whatever he touches.

He showed signs of coming to the fore in a number of spheres very early in life. Born in Kent, he went to a preparatory school at Tunbridge Wells and thence to Uppingham where he was a scholar and exhibitioner. From there he went to Caius College, Cambridge, as a scholar and took an honours degree in Natural Science Tripos. He won his blue for Rugby football and played in the University team. As soon as he went down from Cambridge he joined the Guinness Company in Dublin as a brewer, and during his early years there played Rugby six times for England.

He was an early flying enthusiast, even before the 1914 war. Later he flew on many business trips, and in 1937 toured the U.S.A. by air with Mr. Ernest Guinness.

In 1914, just before the war, he swam Dublin Bay from Dun Laoghaire Pier to Howth Head as the result of a bet. He set out after a day's work in the brewery, and

owing to adverse tides had to swim 12 miles. But for the war he might have made a bid to swim the English Channel. Instead he served in France with the Royal Engineers, rose to be Lieut.-Col., was three times mentioned in despatches and won the D.S.O.

Mr. Newbold joined the Guinness Company in 1903, became Assistant Managing Director of the firm in 1923, and Managing Director in 1941.

To-day he has, on first impressions, an air of being well-attuned to life and undistracted by it, which suggests the cultured country gentleman, or at any rate the man with enough leisure to have his roots in the land and the traditional life of the land.

His broad, solid, athlete's frame seems made for the open air, and it is perhaps some sense of that which makes him fling the wide windows of his office open to the sun and wind and to the handsome oak-trees, planted by Edward VII and George V, which flourish outside.

The Pursuit of Quality

Had he the leisure he admits he would still like to hunt, which he enjoys, and fish, which is his real hobby. But for the past seven years he has given himself so wholly to business that he has lived in the brewery, working seven full days a week almost without a break.

Apart from the two Guinness hop farms, the only farm he ever sees is the 130 acres round the factory, which is built on the site of the former Royal Agricultural Show Grounds. There he can at least visit the herd of prize Guernseys, the hundred pigs and the three hundred hens which flourish on the London air and use up the factory by-products. There is also a market garden, which supplies the factory canteen—one of the most efficient in the country, and originally planned under the supervision of the Salmon family, of J. Lyons & Company, Ltd.

The company also owns one of the largest hop farms in the world in Sussex and another in Worcester. There is an experimental barley plant at Warminster, Wilts., taken over from the late Dr. "Barley" Beaven, and worked in close conjunction with the Ministries of Agriculture of Eire and Britain.

All these are looked upon by Mr. Newbold as of the greatest importance, because to him the secret of the success of the Guinness Company lies in two things—the fact that all the money goes into their product and that the greatest importance is given to research.

The recipe for Guinness is barley, hops, yeast, roast barley (which gives the dark colour) and water, without any sugar or substitute; but unremitting research goes on at up-to-date laboratories at Park Royal and Dublin in order to maintain and improve its quality. The Guinness brewers are a team of about 20 scientists, all of whom are honours graduates in science of one of the older universities. No-one whose qualifications fall



Seen in every paper. Known in every town and shire—a few typical Guinness layouts and the now international slogan—My Goodness—My Guinness

below this standard is ever considered eligible for an appointment as brewer at the Guinness Brewery.

A well-known Cabinet Minister once said that the Guinness Company were the best employers in the country. Mr. Newbold is proud of that and hopes it is true. At any rate he says no-one ever seems to leave. One reason for this is that the organisation is such that everyone employed in it hopes that he has a fair chance of rising to the top.

At the Park Royal brewery, there is no ban on married women. One of the inner circle of scientists is a woman. Many of the women staff marry and remain with the firm, and during the war much of the brewing, including the heaviest processes, was taken over by women, who made a great success of it, and, wishing to remain in their jobs, are doing so.

No Drudgery—No Dead Ends

A further incentive to the maintenance of a good spirit in the works is the fact that the brewery is completely mechanized, and that drudgery and dead-end jobs have been largely eliminated.

To the visitor it may even seem at times that Park Royal is a ghost factory. Its lofty corridors and spacious rooms, full of light and air, and surrounded by fields and trees, are frequently found to be almost entirely empty, so far has the process of mechanisation been carried. Apart from staff there are actually only about 700 employees in the huge Park Royal buildings, while the entire personnel of the Guinness organisation amounts to less than 5,000.

Another of the paradoxes which Mr. Newbold relishes in this connection is the fact that forty years ago the Guinness Company simplified its sales administration by having very little of it at all. The Dublin Brewery did not even have a Trade Department. The beer was simply put out at the gates of the brewery and had to be fetched from there by the buyers, all of whom had to fall in with a high-handed instruction to send in

their money in advance or they did not get any stout.

Trade always has been and still is made for the firm largely by medical recommendation. Nearly two thousand letters from doctors approve and recommend the use of Guinness for health reasons, and the ordinary public feels the same.

The actual reason for the "goodness" is that the process of maturation at air temperature ensures that living yeast persists throughout the manufacture of Guinness and remains to condition it when the bottle is opened. The beer is rich enough in vitamin B to reduce substantially the effects of vitamin starvation.

As Chairman of the Brewers' Society from 1942 to 1945, Mr. Newbold played no small part in the war-time organisation of the nation's beer. His blend of practical knowledge, sound administration and quiet diplomacy proved invaluable to the Society. Close co-operation was maintained with the Ministry of Food, the inevitable cuts were faced and the necessary adjustments in the gravity of beer were made when the strength of beer in each brewery had to be cut by fifteen per cent.

Mr. Newbold, who is now a Vice-President of the Society, was in every sense the right man to tackle these things, because he is a firm supporter of the pub. It is to him a real part of English life and a valuable community centre. Beer, he holds, is a most excellent thing and a food of value to people; excessive drinking is caused by bad social conditions and the pubs shouldn't be blamed for it. He himself drinks Guinness twice a day, and so do most of the members of the Board of Arthur Guinness & Son. At business luncheons held at Park Royal Guinness is always served.

Apart from Guinness and the Brewers' Society and Institute of Brewing, Mr. Newbold sits on many other Committees, ranging from the F.B.I. and B.E.T.R.O. to the Agricultural Research Council. He takes a close interest in the welfare side of the Park Royal activities, is President of the Bowling Club there and enjoys playing with the men.

TREND OF TRADE

Danger of Inflation

BY D. C. TERRETT
Economic Consultant

THE rise in wages and prices goes on, taking the official indices to new high records. And now the increased railway charges have become operative so that manufacturers have to contend with new levels of costs for labour, materials and transport.

But even these new levels are not firm and must be regarded as a first floor landing on the staircase towards still higher costs. It is a simple matter to justify the increased railway charges and higher prices, but that always is the case in an inflationary movement.

The difficulty is to know where to call a halt and it is clearly the responsibility of the Government to have a price and wages policy and to let the business man know it.

It has been pointed out here before that the only answer to rising prices is to increase supplies. The chart on this page illustrates the extent of the gap between purchasing power in the hands of the public and the volume of goods available.

During the war and the early stages of transition this gap was only a potential threat to the level of prices. After one year of peace, however, the conditions have drastically altered.

The soldiers are coming home and their wives are leaving their war-time jobs. In the

past twelve months the female working population has fallen by close on a million women.

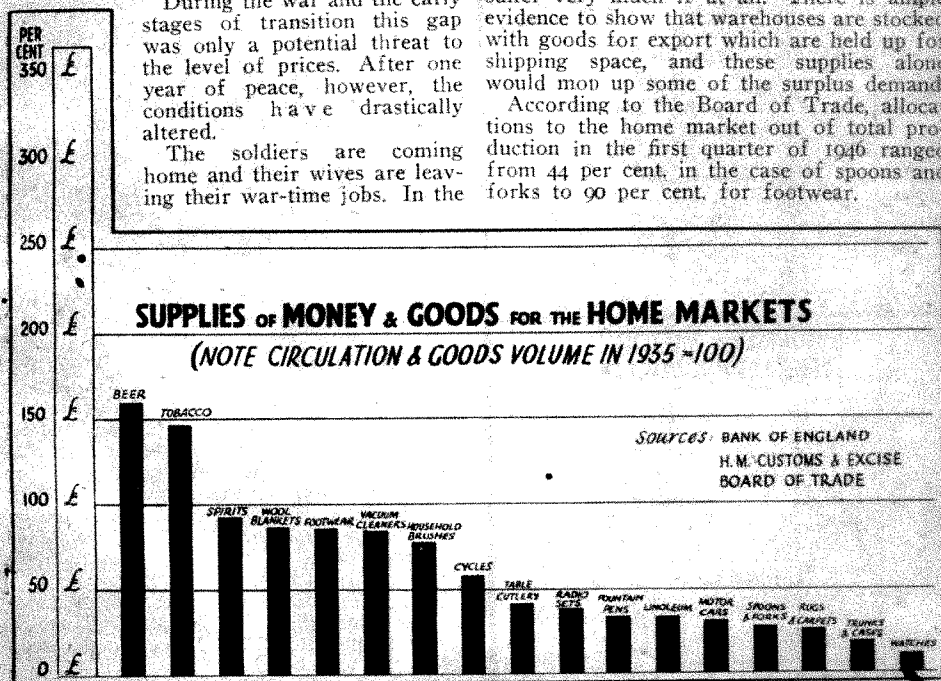
While they were working and their husbands were in the Forces these women had every incentive to save. The incentive is now working in the opposite direction. There are new homes to be acquired and furnished and six years of accumulated arrears in the pre-war homes.

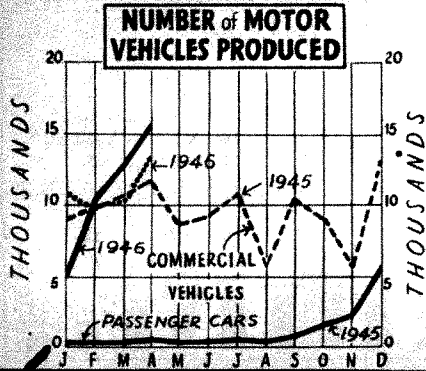
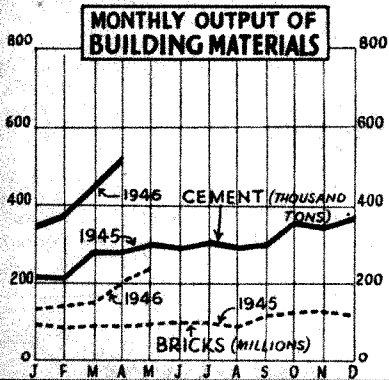
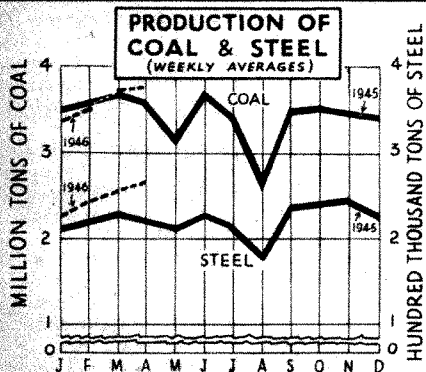
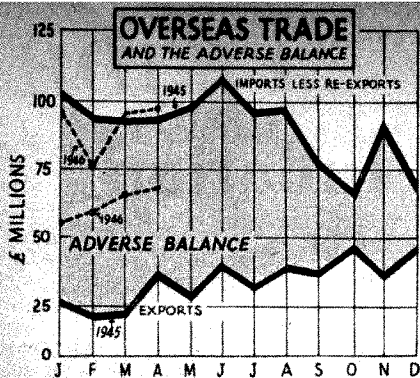
This vast and growing army of released womenfolk is going out on a shopping spree. That fact should be recognised by increasing the supplies of goods available in the shops. These will come eventually out of increased production, but the need is here now and as a safety valve to let off some of the inflationary pressure the Government should release for the home market some of the goods now allocated for export.

This is absolutely imperative and urgent unless we are to see a tremendous boost in black market activities.

It is not likely that our exports would suffer very much if at all. There is ample evidence to show that warehouses are stocked with goods for export which are held up for shipping space, and these supplies alone would mop up some of the surplus demand.

According to the Board of Trade, allocations to the home market out of total production in the first quarter of 1946 ranged from 44 per cent. in the case of spoons and forks to 90 per cent. for footwear.





It is in this class of consumer goods that some alleviation in austerity should be granted.

The export drive in capital goods such as iron and steel manufactures, motor vehicles, machine tools, and all types of machinery must go on. In fact the production effort of this type of goods would receive a direct incentive from a diversion to the home market of greater supplies of consumer goods. It is probable therefore that increased exports in these categories would more than offset a setback in the rate of increase in the export of consumer goods.

The Dutch showed this in their coal mines. Increased allocations of consumer goods were made to miners and their families with the result that coal production immediately increased.

This policy is recommended for consideration to the Ministry of Fuel and Power. Everything so far tried has failed to get more men into the pits or to raise the output per manhour. It is now reported that a five-day week is to be tried. This is a laudable and desirable policy, but it is also an inflationary policy and therefore dangerous in present circumstances.

It is clear that drastic measures must be taken this summer to increase coal output. Failing a very substantial rise in production over the coming two or three months there is going to be a crisis of major proportions next winter, which will threaten the output rate of factories up and down the country.

More Goods Needed

The production effort in other directions is very encouraging with iron and steel production, shipbuilding, motor vehicle output and chemical manufactures all at peak levels. Excellent progress is also being made in raising the output of bricks and cement, although production of the former is still only 40 per cent. of 1938 levels. All these industries are heavily dependent on coal and the current level of activity cannot be maintained, much less improved upon, with the present rate of coal production.

The only safeguard against an industrial crisis next winter and at the same time to give a much needed impetus to production per manhour is to make more goods available to the public now and better still to arrange for special allocations in mining districts.

The shop sales continue to rise on a money basis, and the index for all departments has now reached its highest level yet (apart from December, 1945) at 134 compared with 95 for the whole of 1938, an advance of 25 per cent. In the same period however the Board of Trade index of prices of manufactured goods has risen by 53 per cent.

From the ratio of these two indices it can be estimated that the actual turnover of goods in the shops is still some 20 per cent. below the 1938 levels.

Since the end of the war however the

BUSINESS

sales has particular significance. Sales in London showed a 30 per cent. advance in 1945 compared with rises in Scotland and the North of 4 per cent., and in the Midlands and South Wales of 2 per cent.

This difference was largely due to movements in the population, but not entirely so, for if the index for food departments alone is examined the differences are an advance of 17 per cent. in London compared with 3 per cent. in Scotland and the North, and no change in the Midlands and South Wales.

It would seem, therefore, that the turnover of non-food merchandise in London shops has increased considerably faster than the return of the population to London would warrant. This tendency is being continued in 1946, and if there is anything in the theory that the supply of goods has a direct relation to P.M.H. it is one that should be counteracted immediately.

During the third quarter the number of men and women to be released from the Forces will be 530,000, bringing the total releases since mid-1945 to nearly 4,000,000.

Gains in Capital Industries

Official policy has been to give priority to the capital goods industries with the result that these now show considerable gains over consumer goods industries compared with the relative pre-war levels.

The labour force now engaged in the various types of economic effort expressed as a percentage of mid-1939 levels is shown:—

Per cent. of
1939 labour
force.

Consumer Goods

Miscellaneous household manufactures, toys, etc. ...	91
Food, drink and tobacco ...	87
Clothing industries ...	71
Textile industries ...	68

Capital Goods

General engineering ...	120
Motor vehicles, etc. ...	117
Shipbuilding ...	155
Tools, etc. ...	104
Chemical manufactures, etc. ...	118

Other Classes

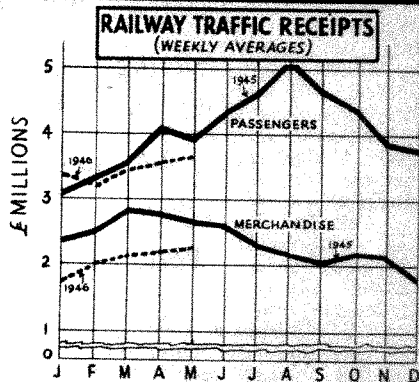
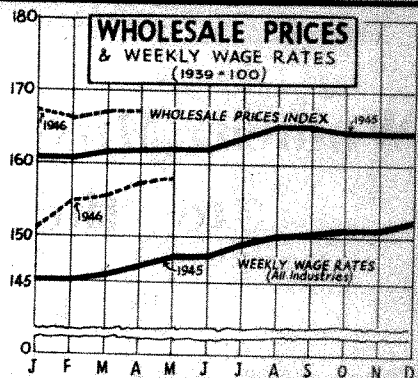
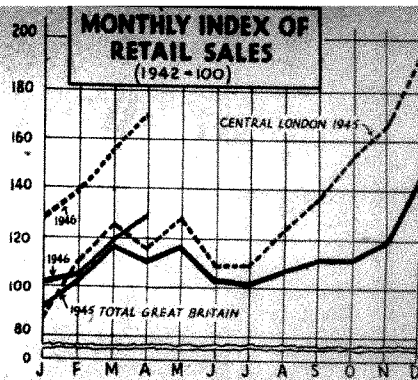
Mining and quarrying ...	91
Building ...	77
Distributive trades ...	81
Civil Service ...	174

The building industry is scheduled to receive another 400,000 men this year which will bring the labour force above the pre-war level. This priority must stay.

It is probably time however that the high priorities given to the capital goods industries should be relaxed, and that the consumer goods industries should be allowed to absorb a higher proportion of the men being released from the services during the year.

The distributive trades will have to remain low on the list, until the supply of consumer goods is increased. Perhaps, by that time, the Civil Service will be able to spare some of its food and other officials.

JULY, 1946



What's happening to Business at WESTMINSTER



Women *Must* be Re-attracted to the Factories

By THOMAS CREEVEY

ON returning to Westminster after the brief Whitsuntide recess, Ministers were confronted with two major economic problems—manpower and inflation. A shortage of the one was developing and a threat of the other had developed. Both must be tackled before Parliament adjourns for the summer, otherwise M.P.'s will have awkward questions to answer when they meet businessmen in their constituencies. On the successful solution of these difficult situations depends industrial prosperity during the coming months.

Dollars will go to Exporters

Savings spent on Household
Equipment

No more Nationalisation
Before 1950

Tariff Dicker With U.S. Coming

During April 33,000 more men left employment than entered it. Should this continue at the same rate the male working population will have declined by half a million by the end of 1947 — an alarming prospect. Something must be done to attract women into industry and to keep them there.

Government estimates of manpower needs give 1,600,000 to the export trades, 1,200,000 in the services, with 500,000 supplying them, 1,400,000 for building and some 14 to 15 million employed on home production, distribution and services to bring the consumption level up to pre-war (Total approx. 19,200,000).

33,000 Men Lost

April figures released towards the end of June disclosed a most dangerous trend: the working population is declining.

Three causes of the fall in numbers at work below the 1939 figure are the decline in the birthrate between the two wars, retirement of older people from industry and the return of women from the factories to the home. The population is steadily changing, with the older age groups increasing proportionately faster than the younger groups.

3,600,000 Workers Short

This target is far from being achieved, the April figures recording a male working population of 14,650,000 and a female one of less than a million and export and services was 15,615,000 of whom 5,615,000 were manufacturing for home or export.

Faced with this situation, businessmen will be well advised not only to keep their labour force at as full strength as possible, but also

to be unceasing in their efforts to save manpower, that is to increase P.M.H.

With labour and goods short, and the demand for both far greater than supply, wages and prices are rising. The Government cannot blame employers for granting wage demands when the alternative is the loss of their labour force. It should blame itself for having no wages policy.

Is Inflation Ahead?

Apart, however, from the normal danger of the wage-price spiral, there are other contributing factors which the Chancellor needs to watch. If prices continue to rise, savings will fall off, and, what is worse, continue to be drawn upon. With prices at their present level, the ordinary housewife cannot buy the goods as they appear in the shops out of the weekly pay packet. With nearly seven years of shortage every household requires vast replacements of household goods. If the week's wage leaves no balance available with which to buy them, war-time savings have to be drawn upon.

This puts the Chancellor on the spot. He has based his budget on a vast volume of savings, and if they are not forthcoming he will have to obtain the funds to cover his deficit elsewhere and that means inflation.

Recent Savings figures are most depressing. The following table gives in millions of pounds the withdrawals of savings during recent years:

YEAR	Millions £'s	MONTHLY AVERAGE.
1942	38.3	3.2
1943	44.7	3.7
1944	62.5	5.2
1945	101.0	8.4
1946	49.2	9.8

(5 months only)

During three out of the last six months repayments exceeded fresh purchases and were doing so during June. The Chancellor was a little premature in suggesting at the Annual Conference of the Labour Party that the inflation danger had been checked. By this autumn, when the new social security rates are paid to the aged, post-war credits are encashable by old age pensioners, and the earned income reliefs are credited to taxpayers, there will be more money in circulation.

Transport Reprieve Temporary

In all these circumstances the Government needs to take the business man into his confidence. Despite Mr. Shinwell's speech at the Labour Conference, the extent of the Government's nationalisation programme was announced last November and will not be departed from. Transport, electricity, gas

and iron and steel are to come next year, or the year after, in that order, and nothing more. Before any further nationalisation takes place the electorate will have to give the Labour Government a fresh mandate. Business can therefore plan with confidence against nationalisation until 1950 at least.

The Minister of Transport is hopeful of getting his Bill introduced before Christmas, but meanwhile road haulage is to be freed from government operation. It is only a temporary reprieve made necessary by the termination of control of road transport a year after the end of hostilities—August, 1946. The Government and the road hauliers are trying to agree on a basis of decontrol which guarantees the carriage of Government traffics and agrees charges.

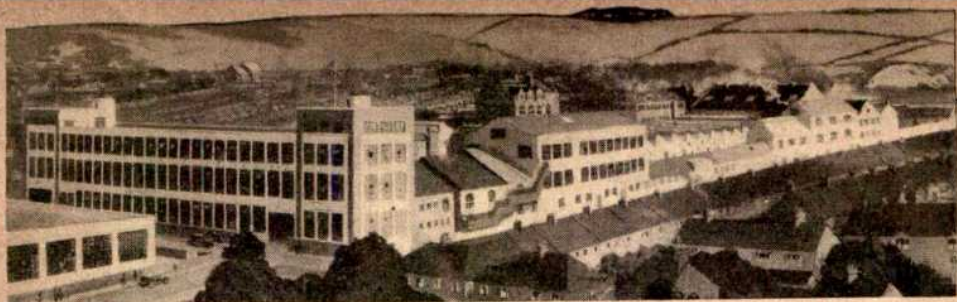
Dollars At Last

The sellers' market continues, but on his return from India, the President of the Board of Trade will occupy himself with implementing the reports of the working parties to the end that when the buyers' market returns British exports can compete abroad both on price and quality. Permanent, not temporary markets are what the business man needs to go after.

The situation will be helped by the final passage of the American loan through Congress and the affixing of the President's signature thereto. During the next five years, £937 millions is available in dollars, but there will be many disappointed applicants. The Chancellor has the last word in their allocation, and he is determined to eke them out according to strict priorities. The test will be the use to which the dollars are to be put; where proof can be established that the dollar purchases will create exports, and earn dollars, they are more likely to be granted.

Tariff Changes Coming

Now the loan is through, the Government must turn its attention to tariffs. During the debate on the Finance Bill unwittingly the Government revealed its plans to negotiate changes in protective tariffs during the next two years. The first Clause of the Bill for instance, provides for the renewal of the Safeguarding of Industries Act of 1921 which would otherwise expire on August 19th this year. Extension for only two years was defended on the grounds that the Government had to be in a position to negotiate changes as agreed upon at the time of the loan negotiations. The same argument was applied to the two year extension for Imperial Preference on sugar. The negotiations may well take a couple of years as the Government has no intention of surrendering Empire Preference or protection without a *quid pro quo* from the United States in the form of an all round reduction.



RECONVERSION — 9

All Out— Operation Harmony

The war's end did not catch GEORGE KENT LTD., (Luton) unawares. From shell-fuses to water-meters, their reconversion was smoothed by careful advanced planning

By A. B. SAVAGE

SUCH was the plan that has enabled George Kent Limited, instrument makers of Luton, to switch from wartime to peacetime production without a stoppage or dispute, without the temporary closing down of a department. A year ago 95 per cent. of their production was for the Government. It included cannon shells, tank track pins, dynamo exploders and a host of other war contracts. Now the factory hums to the manufacture of flow-meters, industrial instruments, steering gear—about half of which is destined for export.

The directors work together as a team, each with a special interest in some aspect of the job. Their intimate knowledge of the factory, and their foresight, have been telling factors in the reconversion.

During the war they realised that the acute shortage of trained and skilled labour made it necessary to arrange operations in such a way that they could be carried out with the minimum of experience. To this end Kent's have set up a Central Planning Office where certain people, divorced from the routine of shop management, can concentrate on the preparation of jigs and tools, shop layout, and other preliminaries to actual production.

Re-planning, they decided, entails four main functions:

1. Determination of the most suitable machine to perform a given operation. Design of jigs, tools, gauges. Preparation of shop layout.
2. Control of raw material.
3. Programming and progressing of work through the shops.
4. System to ensure that the operation is being carried out according to plan, and that the operators are paid fair wages for their efforts.

Under the first heading, there were encouraging features and others not so bright. "We possess one of the best tool-rooms in the country," said my informant. "It is very advanced indeed, and enables us to make all our own jigs and fixtures. We have not had undue difficulty in securing machine tools, and, once they're here, we can adapt them to our own needs."

I went round the steering gear production shop, into which a great deal of new plant and equipment have been introduced (largely operated by women). During the war individual motor drives have been introduced in all departments, to the enhancement of

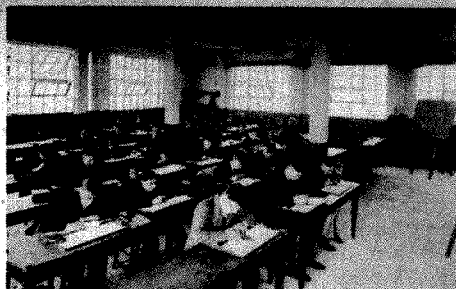
A Team of Working Directors

Reconversion planned in detail months before the war ended.

An up-to-date study of every operation.

Re-arrangement of floor space and adaptation of machines.

A personal interest in the workers' problems and ambitions.



Emphasis on to-morrow's men: an apprentice class at the Kent Works technical school

safety, efficiency and economy. This has necessitated the building of new sub-stations.

More of a problem is the question of space. There is no doubt that Kent's would like to extend their factory, but this is impossible on the present site.

What they have done is to give careful consideration to re-planning the layout of the existing works, and this re-arrangement is now being made with the minimum of dislocation. "Our pre-war layout was in many respects unsatisfactory," they say, frankly. "It was the result of our method of developing a product, the demand for which could not readily be assessed due to the uncertain state of industry, which was undergoing a series of economic crises. Coupled with this was the lack of appreciation of the necessary instruments for industrial processing. All this was being slowly realised before the war, but no clear decision could be made as to how we could best plan our works to meet the growing demand."

Mass Plant Transfer

The War meant mass transfer and re-arrangement of plant, and a set-up that would be quite unsuitable for peace-time production. And so, like an ill wind, and the good which proverbially follows, it made imperative a drastic re-planning scheme. To go into detail would make unfair demands on our space here and would be rather superfluous, since George Kent's needs are highly specialised.

Sufficient to record that the main machine and assembly shop is being situated centrally, with the ancillary departments grouped in and around it. This area is planned to accommodate plant necessary to produce instruments of all kinds, especially those made on a semi-mass-production basis. Instruments produced in small quantities will be manufactured in a

shop specially equipped, and staffed with skilled personnel.

Panel construction is carried out in a shop conveniently situated opposite the main metal store; here are embraced fabrication, spraying and final assembly. There are nearly a score of departments in all, and they are now so arranged that the work flows steadily and logically to its conclusion.

Fair for Materials

So far as raw materials are concerned, they are now able to get pretty much what they require. It was different during the war when, for instance, fabricated steel had to be used for instrument casings since aluminium was in short supply. Perhaps this was a blessing in disguise, because it entailed a big increase in the fabrication plant, which is now being used to full capacity in the manufacture of instrument panels.

There is little to say, either, about the programming and progressing of work through the shops. It has been much simplified in the re-organisation detailed above. The administrative unit is highly mechanised, and the firm employs its own time study engineers.

So much for planning. But what about the human element?

Since George Kent started in 1838, and since the days of the famous knife-machine, the firm has taken a very genuine interest in the welfare of its employees. When they join the firm, or come back from the Forces, they are interviewed by a man or woman welfare officer and fitted into the job that seems most suitable.

But the matter does not rest there. A follow-up report is made in due course, and if a change seems desirable it can generally be arranged. The firm has two medical officers, a resident nurse, a hospital and benevo-

lent fund, a life-insurance scheme, and all the usual sports and social facilities.

Luton has perhaps a greater diversity of industries than any other town in the British Isles. It is extremely difficult to get even unskilled labour. Of the five hundred who left to join the Forces only about a quarter have yet been released. Most of them have come back to Kent's—which says a lot for their attachment to the firm.

Before the war there were 1,800 workers, in the peak year of 1942 there were 3,120, now about 2,500 are employed—and they could do with more. The working week averages 47 hours.

Another irritating factor is that they get youngsters from school at age 16, train them for a couple of years and then lose them to the Army.

"In fact," I was told, "Staff problems are

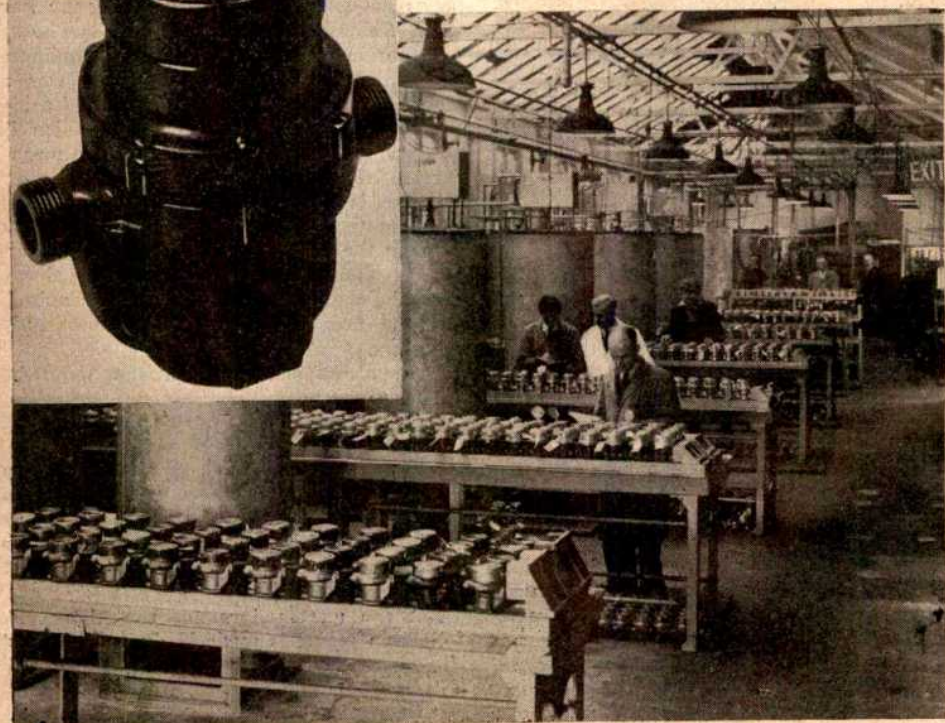
perhaps our biggest headache. We hope they will sort themselves out. The important thing is to get back to our peacetime 'family atmosphere.' We have many workers of over 25 years' service, some have done over 50. We believe that the more people know about their job the better they will do it, and so we do everything we can to keep them informed."

Good Works Relations

I saw proof of this in attractive and informative booklets that are issued from time to time. A works paper is contemplated. It will be a straightforward record of work and recreation—no pep talks. All over the works are loudspeakers. They give no pep talks either—just music.



A general view of the water-meter department with (inset) one of the Company's staple peacetime products, made and exported in large quantities — a mechanical water-meter for measurement of domestic and trade water supplies



The joint production committee works harmoniously, and from its discussions many improvements have been made and difficulties overcome with the minimum of friction.

World-Wide Service

George Kent's are also concerned with servicing and erection. They have their own offices in Johannesburg, Melbourne and Penang. One of the directors, Mr. A. W. Gregory, is at the moment on a visit to their agents and representatives in Australia. Since the beginning of the century they have supplied meters to customers abroad, and for six years it has been impossible to replace them.

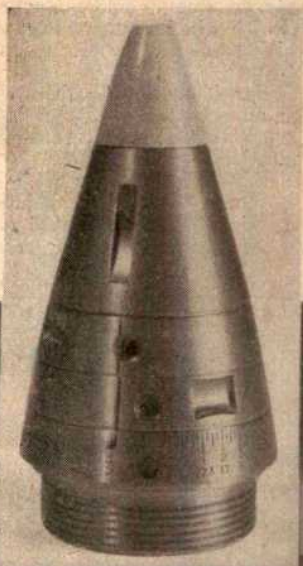
For this reason Kent's are going all-out on the production of one of their main lines

—mechanical water-meters in order to increase the export trade.

Space precludes any detailed resume of the staggering figures of Kent's war production. They made screens for warships, steering gear for harbour craft, cannon shells, fuses, chronographs, dynamo exploders, predictors, winches, track pins, transformers, searchlight driving motors, thermostatic valves, electric motors for radar . . . and, of course, meters for measuring water, gas, steam, petrol and oil.

Changing over from that lot, you think, is quite a problem. But not such a problem as the switchover from the previous war. On that occasion the whole factory was turned over to making fuses; they had 6,000 on the job, and their own filling shops. And the lessons of 1918 were assuredly remembered in 1945.

Another view of the same department transformed in war time for the assembly and testing of petrol meters for aircraft. It has now been reconverted to the needs of peacetime production. Inset is an anti-aircraft shell fuse—just one of the five million which Kent's manufactured



Batch Technique Costs Too Much

From A Consultant's Case Book. No. 3

By JOHN W. HENDRY, F.R.Econ.S., F.I.F.M.

THE subject for this month's analysis concerns that hotly debated subject, whether production shall be flow-line or batch. Naturally no hard and fast rules can be laid down which will satisfy the individual requirements for any particular firm.

There are, however, some general rules which, when applied, show a route along which firms may be able to find an appropriate channel which will lead them to make their own decision in the wisest manner possible.

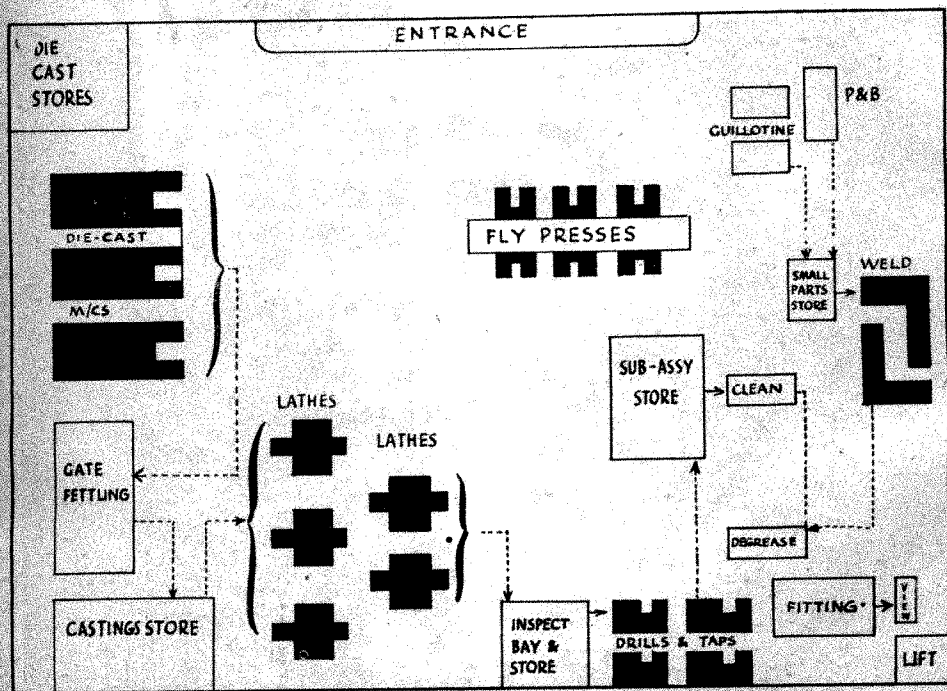
In this particular instance, the firm was faced, not with an acceptance of the flow-line technique, but with the problem revolving around its application.

The traditional batch production with its insistence upon stores handling and inter-departmental trucking had been carried out, during the war and after, with the result

that, now the firm in question were concentrating on only 50 per cent. of their pre-war lines, batching was "top heavy."

The application of flow-line principle was therefore obviously desirable, but as a seller's market waited to be satisfied, a shortage of labour existed that could not be easily budgeted for or controlled, and with very large order commitments, the firm felt that although it was desirable to switch from batch production to flow-line, it should not be done without giving the matter most careful study.

The first stage in the development was (a) proving the need for flow-line; (b) applying flow-line. This called for the accurate measurement of the amount of handling time involved in the various components, parts and assemblies. An investigation on the machine shop side of the processing revealed



OLD ROUTE: Involving double handling through storage and batching

that an average time of 465 minutes per piece was being spent on handling alone.

Clearly on a quantitative turnover of some 5½ million parts per year, this represented not only a possible leakage of profit, but also demonstrated that labour was being extravagantly used. This handling survey involved the measurement of the parts from the raw material stage in the following order:

(1) From delivery route to stores; (2) From stores to die-casting machines; (3) To gate-fettling; (4) To castings stores; (5) To centre and turret lathes for turning; (6) to inspection bay and stores; (7) To drill presses; (8) To sub-assembly store to wait; (9) Component parts to guillotine; (10) Pierce and blank; (11) Small parts stores; (12) Weld; (13) Sub-assembly stores to clean and degrease; (14) Components parts, fly presses and sub-assembly stores; (15) Fitting; (16) Viewing; (17) Despatch.

It will be seen that each single operation involves a minimum of three operations which are "load for transport," "transport" and "unload."

These operations are the *minimum* and assume an efficiency that in fact does not exist because it will be seen that the transport also must include "resting" at the inspection bay, sub-assembly stores and the small parts stores, thus due to the traditional batch handling, a considerable amount of time was lost per annum, together with a considerable dissipation of time and energy in handling paperwork in order that the

proper segregation of parts and their control might be attained.

The total handling time then involved an annual man-hour dissipation of 41,040, which is roughly equivalent to 20 operators, which at an average wage of £4 per week equals £4,000.

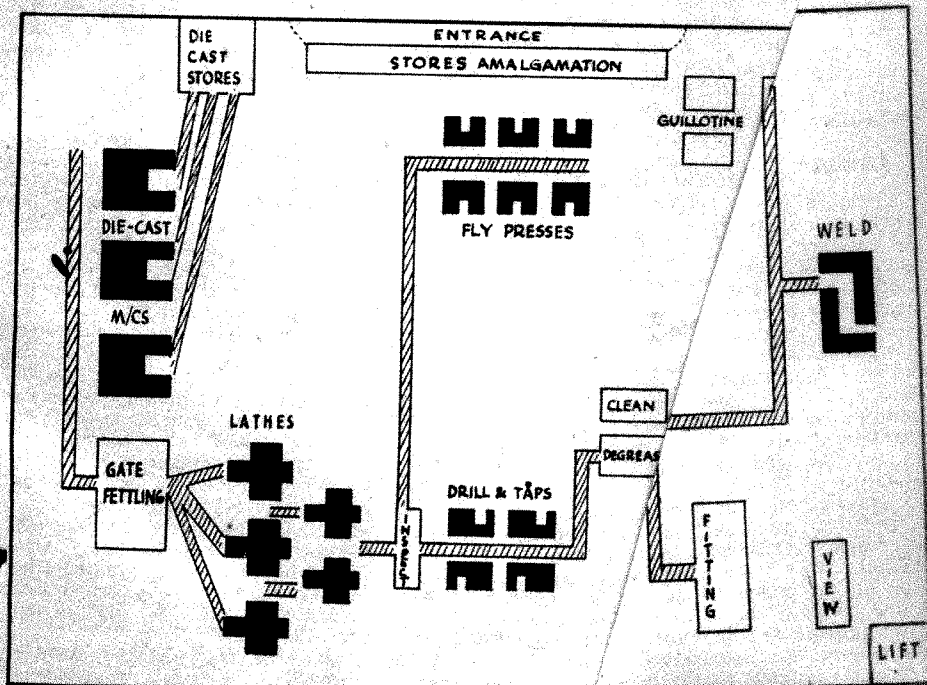
It must not be assumed that the application of the flow-line principle cut out all this labour, but it can be stated that the saving was extremely high.

It was assumed by the management of the firm concerned that the inculcation of flow-line principles would necessitate a complete re-building of the machines and assembly base, which would probably entail a great disruption of production.

This would have been true if the ideal to have been attained, but as in all cases spirit of compromise prevailed and by the altered layout made no claims or tensions at being worked at optimum efficiency, it did however permit the change to be made without interrupting the production targets by more than 3 per cent was, of course, re-couped after the first few days' working.

Reference to Fig. A, shows the layout together with the work flow which did not flow at all but merely went to to certain specified resting places of the await checking, inspection and relevant paper-work.

Referring to Fig. B, compare between



NEW ROUTE: No "resting", halves handling because of "Flow Line" technique

Dictation 1946

The World's Phonetics On Only 29 Keys

120 Words Per Minute after Six months Training

By ARTHUR BARTRAM

At a London school of stenotyping they believe that the drudgery and pitfalls of writing, taking and transcribing manual shorthand may in time be as archaic as the system of correspondence on stone slabs. Now there has arrived a silent, portable machine. It looks rather like a small suitcase and weighs only a few pounds. It sits comfortably on the knees and can be used in any facility in office, train, car, plane or home fireside.

On a sheet of paper about 2½ inches wide (the size of the ordinary letters of the alphabet), plus only two conventional signs, anyone can produce a script that can be read by anyone.

Here is the short lesson. For when a typewriter ends, a stenographer gives each letter separately. A stenographer gives each letter complete. A stenotyping machine prints a complete word, syllable, phonetically, at one stroke. It has only 29 keys.

Anyone Can Read the Script

The idea is new, of course. Stenotyping proved its value long since—at UNO, for instance, at the Casablanca Conference, and at the Ministry of Information during the war. But there has never been a British machine or a universal keyboard which can record any language.

When I called at a London school, an executive was reading dictation speed to an operator who nonchalantly touched the almost-silent keys. Letters of paper folded themselves neatly into the back of the machine. The girl read back without any hesitation.

I suggested that another operator be called in, and this was done. She took the pack of paper and transcribed it effortlessly.

Then I was given a five-minute lesson in phonetics by means of an ingenious electric device used in the classes. The recorded script became crystal clear, and I too was able to read the first operator's notes.

Next I dictated to the girl a fairly stiff passage in French. She took it down with-

out trouble and read it back to me—every word distinct and correctly pronounced. The amazing thing is that she hadn't the faintest idea what she was talking about, since she had no knowledge of the language. She could have handed her notes to a French-speaker familiar with the script who could have reproduced the passage with perfect accuracy.

A Challenge to Babel

It is claimed that no European or Eastern language has yet proved beyond the machine's capabilities. The advantages of this are obvious. To take a factual example: a Government official dictated in Japanese to a stenotypist who had never previously heard that language spoken. She was able to read it back so clearly that a typist (who did not know how to use the machine, but did have a knowledge of Japanese) could record it.

All nervous and muscular strain are banished. The hands are poised in a natural position, all ten fingers are used to do the work, and the action is so effortless that high speed dictation can be taken for hours on end. The well-trained operator reacts to sound without hesitation and takes down what is being said automatically.

One operator in a busy office could keep a pool of typists busy. It would need a little arrangement, but should not be impossible, to give each executive a set hour for dictation. The operator could send her notes down for typing at the end of each session.

The notes themselves constitute a permanent record. Where necessary, such verbatim records of interviews, conferences, board meetings and so on can be stored away—they will be just as readable in ten years' time. Correspondence between head office and other departments of a concern can be torn straight from the machine, posted, and read in note form at the other end.

An executive can, if he wishes, learn to operate the machine, take his own notes, and pass them to his secretary for transcription.

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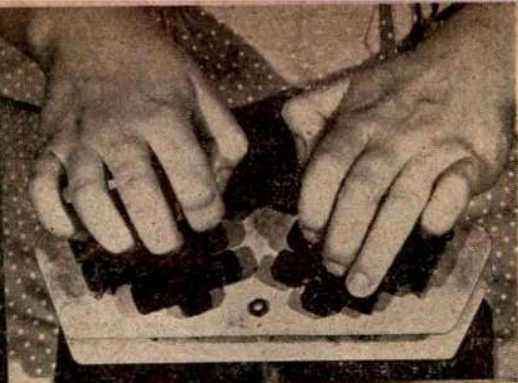


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Getting the word "pack" — phonetic p/ac—right thumb on A key, first right finger on C. The tips of both fingers touch each other although the right thumb on both keys is permitted. A view of the practice keyboard and left the operator stenotyping a nine-man conference

So far as speeds are concerned the machine has not been tested in London to its fullest capacity. What they can claim, from experience, is that a girl can comfortably reach 120 words a minute after from four to six months' tuition and practice of two hours a day; and some of their pupils have surpassed the 200 mark.

For most purposes a speed of 200 words a minute is more than adequate. It is generally agreed that special assignments like Parliamentary reporting demand a speed of 250, and there is no reason to doubt that this would be within the range of an efficient operator after some months' constant practice.

I watched a couple of classes at work, one of beginners and the other more advanced. There were about half a dozen pupils in each, mostly using practice keyboards. For the beginners' class the instructress was dictating syllable by syllable; for the more advanced students dictation was being given in short sentences at a fair speed. All the learners, men and women of wide disparity in age, said they were making good progress and were enjoying the tuition.

There are lunch-time classes for business people, and evening classes, normally until 7.30. Where a class of a dozen or so can be arranged at an employer's own premises, the school is prepared to send an instructor.

When an operator is proficient—that is to say, when she has attained a speed of 120 words a minute—he or she is allowed to own a machine. Alternatively, the employer can buy the apparatus. But until stenotyping be-

comes a universal practice the operator will generally prefer to own her own machine.

To sum up:

It is obvious that in many offices stenotyping will have advantages over the current system.

Reading back from the notes, even if you don't know a thing about the machine, can be learned in a few minutes. I proved this for myself.

To get a trained operator (even, for that matter, to get a machine) you must be prepared to allow an intelligent girl two hours a day for six months to attend the school.

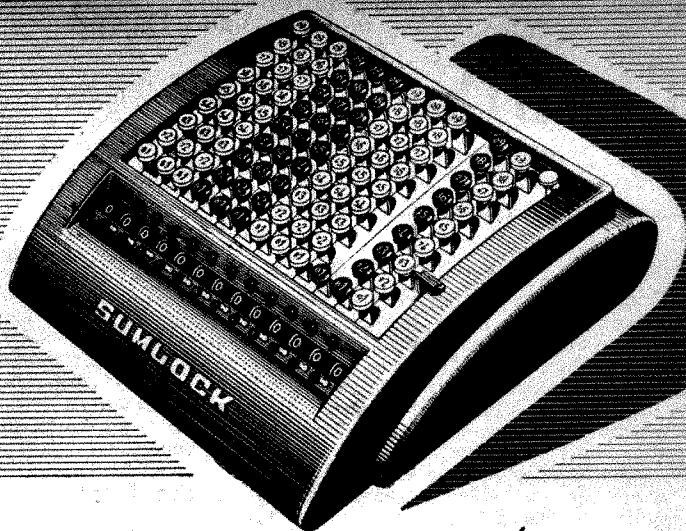
Brought to Berth

A system that will enable flying boats to run into a station like a train has been made possible by an automatic cable pick-up devised by a firm of flying boat constructors. After alighting, the flying boat taxis towards the cable, which is held at water level, and a winch pulls the boat to the station. The process can be reversed.

Weather by Wireless

The first Arctic automatic radio station, designed to conduct meteorological observations without personnel to service it, has been set up on an island in the Kara Sea. Moscow radio says that the station is constructed to work for two years without overhaul, and transmit weather forecasts regularly by means of a special wireless code.

BUSINESS



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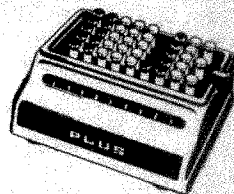
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SIX SHORT CUTS *to* Office Efficiency

Music While You Type

A FIRM which has installed amplifiers to provide music for its office workers during business hours is so delighted with the idea that it invites customers and friends to come and judge for themselves. It may be assumed that the typewriters click only to the more lively rhythms—a *valse triste* would have a disastrous effect on output.

This reminds me of a happy idea effected by H.M.V. before the war. If a telephone caller was required to wait a few moments for a connection his instrument was automatically switched on to a gramophone record.

—And Films, Too

IF that isn't controversial enough, what about films? Seriously, Underwood's have made a 16 mm. training film which is well worth exhibiting to your typing pool. It features George L. Hossfield, ten times winner of world typing contests, and illustrates many useful typing tips.

And now all that your office workers require is a smoke. Long banned in most offices, smoking is now being more widely permitted. General Motors find it increases efficiency, but a competitor disagrees violently. "Smoking at work costs my company a fortune each year," he says.

What do *you* think?

Tips for Exporters

AN Empire business visitor gives these hints to British offices corresponding with agents and prospects abroad:

When giving the weight of a package, state it in lbs. The cwt. is little known outside Britain, and the quarter is not known at all. If you have to refer to tons, insert 2,240 lbs. in brackets.

The cubic measurement of a package should be given to the nearest cubic foot. It may be a healthy mental exercise to work out 1 ft. 3 ins. x 2 ft. 9 ins. x 3 ft. 8 ins., but not everyone has time for it.

In dealing with other than English-speaking countries, use the metric system wherever possible. Hogsheads, stones, rods, poles and perches are, happily, mysteries to them.

If you are specifying an article of some size, give its height, width and breadth. The prospective customer has to fit it into the space available. He will be delighted to show his friends how cleverly he reserved exactly the right space for your machine.

The Little Things

AMERICAN businessmen divide neatly into two camps in a good-humoured dispute about cutting office costs.

It all began when an executive said it was silly to try to measure the length of pencil stubs, to require the inspection of carbon paper, before discarding—and similar petty economies.

Typical comment from the other side: "If a close enough check is made on the small, 'penny' items, the larger and more costly things will adjust themselves. I find that office supplies, distributed with no apparent supervision, soon become very costly. Keeping one's eye on them is a contributing factor to running an office efficiently."

But they are all agreed that buying the very best quality materials works out more cheaply in the long run.

Easy on the Eyes

SIMPLE but ingenious is this method of setting out cash columns in such a way that they minimise eyestrain and are incapable of misinterpretation. Most of us have suffered at one time or another from the unit figure of the £'s creeping into the shillings, or the pence finding their way into the next column. It is a mistake all too easy for a busy wages clerk dealing with a large sheet of cash figures.

Payroll Summary

£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d
7	5	8	1	11	2	19	7	10	35	16	1						
13	15	4	-	14	75	-	16	9	108	2							
11				8		3											

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By stepping down the shillings and the pence as shown in this illustration the possibility of error is much reduced. For a firm with a fairly large payroll, or other similar statistical sheet, the extra cost of printing should prove a worth-while investment.

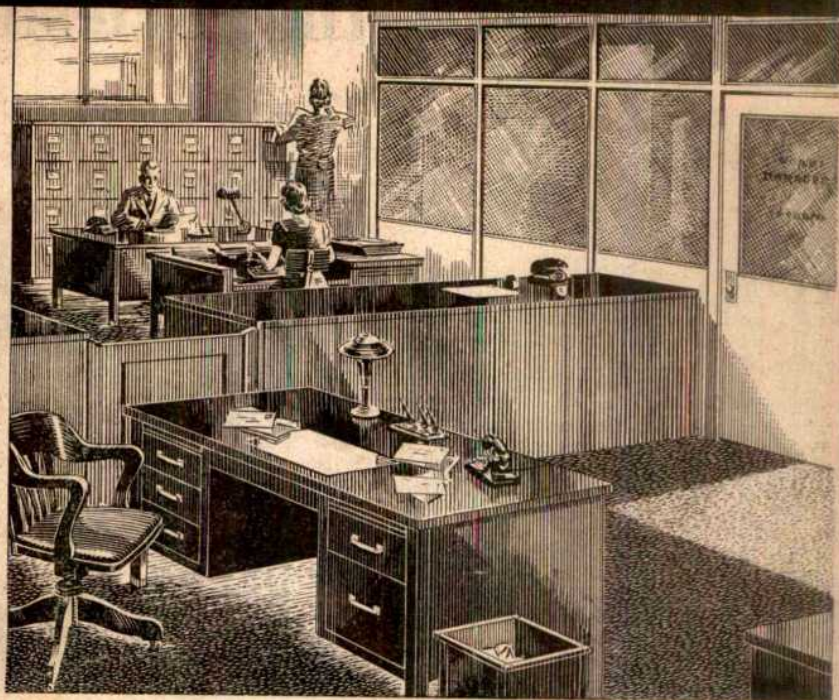
Second Echelon

AN important industrialist has introduced what he calls a Special Services Department, designed to organise and maintain those services which ordinarily steal precious minutes from office supervisors and other overburdened executives.

Falling within the province of this department are the messenger service, mail, duplicating, transport, allocation of office-space, telephones, building maintenance and repairs—among many other services that will readily suggest themselves.

Although the company's office chief is responsible for the efficient working of the S.S. Department, he is provided with the assistance of a capable junior who actually handles the service details.

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How the Sales Manager Can Inspire the Salesman

Tell him — "There's a Job at the Top!"

By JOHN McCREESH

HOW can the sales manager get his message across to the salesmen? How can he enthuse them with his own spirit and determination and inspire them to action?"

It is in the answer to this "How" and its application that the successful sales manager transcends, and it is here that the psychical merging of character, temperament and environment, which combine to mould the personality that distinguishes us one from another, plays its part in signalling out the sales executive for honours.

It is said that a sales manager should be a reservoir of dynamic power, radiating energy and confidence. But, it is by the sheer depths of his earnestness and sincerity that he commands respect and inspires his team to high endeavour.

Among the many hints on "selling" which the sales manager should never tire of bringing before the minds of his salesmen is this one—"Look from the prospect's side of the fence! put yourself in his place! this will put sincerity into your words!"

The sales manager, himself, must do this very same thing, only "look from a salesman's side of the fence." Experience will tell him, that just as the Salesman is the Company to the Customer, so is the Sales Manager the Company to the Salesman.

The sales manager is always before the salesman's mind, and although he is not actually present, it is the sales manager's influence that is at work, inspiring him to action. He is the pivot around whom the salesman moves for almost a third of his life. It is to him he looks for encouragement in time of stress and for genuine praise when his results are good. In both cases, help or praise—even if the salesman does not ask directly for this—should be given, and should not be given niggardly or meanly, but earnestly and generously.

Now, whether this influence of the sales manager is acting consciously or sub-consciously, it is nevertheless real, and this fact should be kept well in mind by the sales manager, conscious of his own great responsibility.

Whatever the truth of the old precept "We all get what we deserve, no more, no less," I believe that the goddess "Chance" is

not so blind as she is painted, and that the old precept does apply to the man and his job; the leader and his men, and especially the sales manager and the team he gathers around him.

They will be just as great as he aspires to be or just as mean as he is content to stay. He can, by his actions and example, raise them up to his own level. In fact, he is being judged by the men around him, just as surely as if he, himself, and not his representatives made the hundreds of calls upon prospects and customers every day.

It is so essential that the sales executive, perhaps more than most leaders of men, should understand the type of man with whom he is dealing. The salesmen are apt to look upon him in the same critical frame of mind as they have been trained to analyse the prospects and customers they meet.

Sincerity Gets Results

There will be no genuine signs of ingratiating mannerisms when the successful salesman meets his chief; he will be quick to perceive any signs of pretence or insincerity; he will be sensitive to every impression and, consciously or unconsciously, he is alert to those little psychological tricks.

There is, therefore, no need to impress a salesman by ostentatious display, or clever talk. The key note of all the sales manager's dealings with his salesmen can be summed up in two words, *true sincerity*.

It is not what a sales manager says to his men, it is how he says it: the sincere feeling he puts into his words. This warmth of feeling cannot be assumed; it must be based upon a genuine interest in the man's welfare; true loyalty to the Company on whose behalf he speaks, and, an honest belief in himself and his own job.

This sincerity will dispel all doubt; the salesman himself will admire it and will be impressed, and, imitate such qualities. It will put enthusiasm into him. It will fill the "daily bulletins"—which should recall to the salesman's mind the little hints on selling—full of meaning.

In these bulletins the sales manager should tell the salesman to—"Be sincere"—"Be earnest"—"Believe in your own goods"—"Be

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loyal to yourself and the house of X —
"Keep your eyes fixed on that positive result!"
—"Watch your approach—first impressions count!"—"Go out and achieve your goal!"—
Duplicate these slogans in large type on the bulletin sheets.

Keep the triangle I mentioned in my last article before his mind, see that he knows his job and all about the goods he sells. Persuade him to understand that his is not a blind alley job but one in which he can achieve his desires. Interest! what a lot this word means! then be sure you have *his* interest, and go with him all the way. Tell him so. Put feeling into your bulletins and the spoken word, for long after logic and cold reasoning are forgotten, feelings and impressions are vividly recalled to mind.

Set An Attainable Target

The sales manager's first duty should be to create sales and he must, therefore, attend to the human medium through which this end is attained. Never be it said that he has no time to accompany his salesmen or inspect their territory or gather them together for refresher courses. He must make time and get down to it.

Personally, I don't believe too much in competitions for gold watches, silver pencils, etc. There is a higher target to aim at, namely, "achievement" for here is the root of human happiness. Achieving something, however humble, is the outlet for the self-determining tendency of every individual. Work on this psychological principle; it is a higher ideal to set than the winning of a gold watch.

Let this achievement be the prize; work this aim through the sub-divisions to the divisions and thence to the whole organisation. Set it high, as high as the Managing Director's chair.

Tell the salesmen "There's no queue for the top jobs—aim high! Create by your earnestness and integrity an atmosphere of loyalty and co-operation; dispel that negative attitude of mind—that "it's just another job." It is worth every effort. It will pay high dividends in the happiness and keenness of the salesmen.

Salesmanship is an art. Call it by this name and uplift the status of the salesman. It is just that touch of snobbery which makes all the difference and gives him a pride in his work.

Interest your office staff in each salesman's results and make this interest obvious to him, he will like it, and it will spur him on. Spread enthusiasm from the office boy to the Managing Director, for it is contagious—then disseminate it like healthy germs.

It is a good idea to send out simple little graphs showing, by means of a curve on squared paper, first the salesman's own results, then, that of his sub-division, with a relative curve showing the quota set for the sub-division up to date.

With regard to this quota, the sales mana-

ger should be quite sure that it is reasonable and attainable. It is a great mistake to set it so high at first that it discourages by its very magnitude. In the fixing of quotas, with all due respect to costs, services, etc., it is better to use discretion, and the sales manager should go into this matter very thoroughly.

It is better to sub-divide the annual quota, that is, if this quota be set at, say, £5,000, calculate this down to a monthly figure of £455, allowing say, a month for holidays, etc. This will keep the salesman up to scratch and so discourage any tendency for him to lag behind, and it will not overawe him by its seeming immensity.

The sales manager should give as much attention and thought as possible to those daily bulletins and make certain the salesman is being kept up in the knowledge of and love for his work. Guide him—but do not destroy his initiative—in the intelligent planning and organising of his ground, by analysing his "daily reports."

Watch these reports carefully, for they can be very instructive, and see that the good prospects are followed up. In most cases, after four calls on a good prospect, a sale should result, either to the salesman or to his competitor; if no sale, he may have either oversold the article or failed to persuade his prospect to decide. But reports are a good sounding rod in assessing the salesman's ability and the good sales manager knows by their aid when the time has come for him to act.

Be Accessible

There is one important point to remember; never allow a salesman to copy anyone: encourage him to learn from experienced salesmen, but to apply what he has learnt in his own particular way—to be, in fact, his natural self, and not a poor reflection of someone else. This will help him to develop his own personality.

Always be accessible to the salesman—there is no need for mollycoddling—but there is need for understanding. The delicate nature of his task in dealing with human idiosyncrasies call for similar treatment from the sales manager.

Social gatherings should be encouraged and the sales manager should attend, if possible. If he remembers that his behaviour is being closely watched by men who "look up to him" and respect him, he will make a double success.

There is no easy road to success, especially for the sales manager, but the way can be made pleasant if he knows what he has set out to achieve and is steadfast in his purpose. Know what you want; be tolerant but vigilant; be fearless but chivalrous.

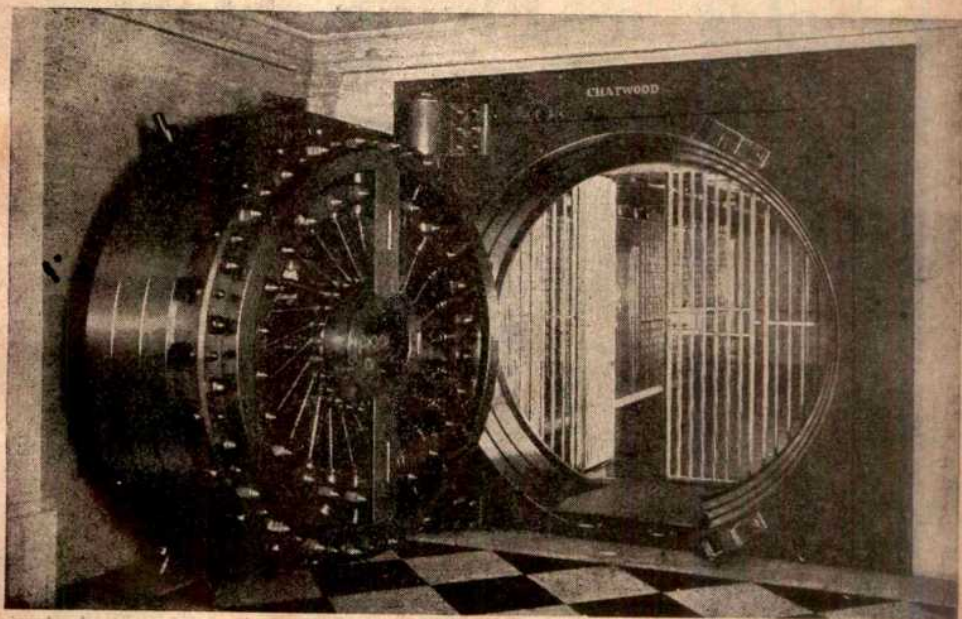
Remember, today you are the general commanding the army which must recapture the world's markets for his country. A peaceful, but a truly great and lofty purpose, and one which you and the men at the guns—your salesmen—must earnestly aspire to achieve!

Construction for Protection

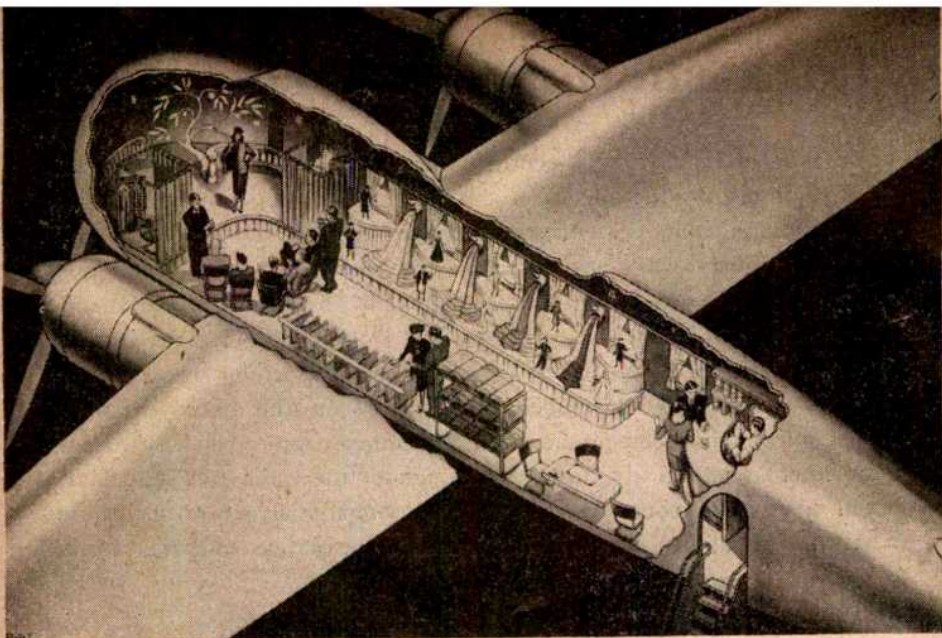
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Give Your Sales a Flying Start

By ROY LACEY

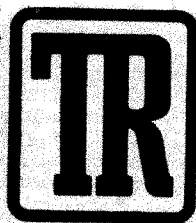
LAST year, in the July issue of *BUSINESS*, I briefly outlined the facilities that might exist to British manufacturers interested in the export of their goods by aircraft. The situation was then extremely fluid; our aeronautical constructors were busy and had designs in prototype, but not in production, and the entire field of operators and intending operators was awaiting some indication of the Government's policy with regard to civil aviation.

Now, far from being in a fluid condition, the foundation stone of British air transport has been firmly laid with the publication of the White Paper on that subject, and building is now in rapid progress. Instead of purely guessing at subsequent developments, we may look to the future equipped with certain generally known facts upon which to base our suppositions. Before discussing the types and operation of cargo aircraft, let us first establish the aeroplane's place in the export drive, and then consider the class of manufacturer to whom transport of his merchandise by air will prove a sound commercial undertaking.

Critics of the air transport of cargo have, in the past, scoffed at the suggestion that the carriage of freight could become an economical proposition. They argued that an aircraft's relatively high operating cost compared with that of surface vehicles prohibited its use, and they further maintained that several hundred aircraft would be needed to deliver the same weight of cargo carried in the holds of an average size merchant ship. In addition facilities for the loading and disposal of air freight, outside the United States, were either non-existent or in an embryo stage of development.

These were essentially pre-war criticisms, and applied to the condition of British aviation in 1938, they were justifiable. Six years of war, however, stimulated the development of flying and to-day, even the most cynical of critics is bound to admit that aviation is now of supreme importance as a transport service and has fully established itself as an industry. The Transport Command of the Royal Air Force maintained a standard of service during the war years that should be equalled and then surpassed if this country

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Before proposing the classes of manufacturer who would most benefit by using air transportation, it is most necessary to dispel any doubts as to the cost of using aircraft for the export of British goods. At the moment costs are higher than the orthodox surface vehicles but are being substantially reduced with the introduction of new aircraft specifically designed for freight operating alone.

Transit costs such as those resulting from export packing, trans-shipments, inland transportation and financing costs result in overheads to the exporter of as much as from 20 to 30 per cent. on the value of the article itself. Additionally, goods shipped abroad by ocean transportation require strong boxing and crating and inner protective packing in order to avoid damage claims in the event of rough handling during shipment. Bearing this in mind, cargo aircraft are ready to-day to assume an important part in reducing export transit costs.

Value in relation to weight and speed in delivery will remain the determining factor in air transport of cargo for some time to come. Bulky goods, such as mining machinery, engine components and large tools or engineering apparatus can be carried in aircraft but economically, only when there is urgency over delivery or when surface transportation is insufficient. For an imaginative but appropriate example; were a mining

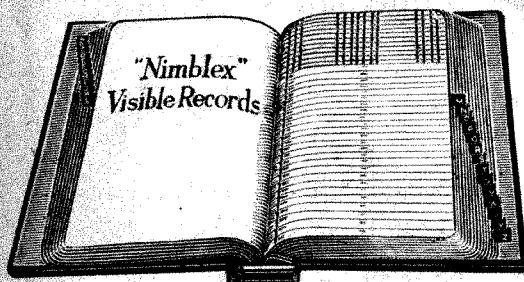
urgent demand for high-class mining equipment, in order to supply the demand and also to beat the market, an engineering firm could get the goods from Britain in a matter of a few hours.

More logically, women's fashions on view in London, say on the Monday of a week, could appear in South America by means of a flying show-room on the following Wednesday or within two days. Similarly with leather goods, newspapers, choice flowers and medical supplies, speed would be important. Valuable hardware goods, watches, jewellery and delicate instruments can be shipped overseas with speed, safety and low trans-shipment costs in comparison with ocean transportation. Delivery direct from the producer to the consumer without trans-shipment will be the ultimate service offered by air transport.

Lord Winster, the Minister of Civil Aviation, has repeatedly announced that in building British civil air transport the fullest co-operation will be sought from existing passenger and cargo handling organisations, including the shipping lines and travel agencies. If this is fulfilled, air transport in addition to those services outlined above, will be of supreme importance as a supplementary service to surface transportation. Thus goods shipped by cargo vessels to South Africa can be picked up by freight-carrying aircraft and flown inland to the consumer.

To be continued.

Look at your Records



—not for them

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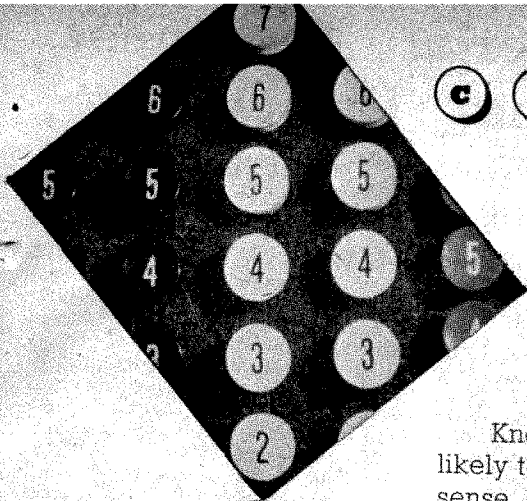
Loose-leaf Book puts an end to *recording and finding* problems. The details are *right in sight*. You see the titles of 25 records at a glance without turning over pages that you do not want. The Binder is operated with the greatest ease; it is light and durable and the cost is low.

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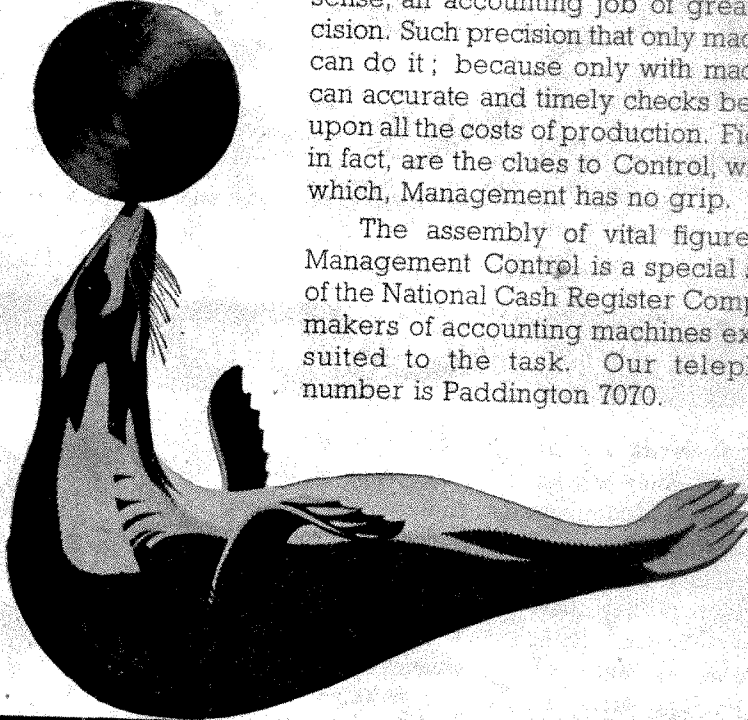


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Adjusting Material Movement To Seasonal Demand

Tractor Trailer System Overcomes Labour Problems

By F. H. SLADE, A.M.I.Mech.E.

IT is very apparent that the need for the conservation of manpower is as important now as during the war years, and will continue to be so, for although industry is experiencing great difficulties to get the wheels of export trade turning again at a time when supplies for the home market have been restricted in order to free the maximum quantity of goods for export, before world trade becomes competitive, a more serious situation is to be faced if market competitors of greater manufacturing flexibility recover at greater speed than ourselves.

Owing to the scarcity of labour, the war period, and the increased costs of production, the whole field of materials handling has undergone important changes. Machinery is now being used to do that which was formerly done by hand, and to do it more efficiently and rapidly, with the result that hand methods of materials handling are quickly disappearing.

It is probable that the industrial truck has done more to bring about these marked advances than any other innovation, for it can, by reason of its flexibility, be readily adapted to all industrial plant, old and new.

Of the various basic types of modern industrial trucks, the one which generally offers the most tons-transportation for horsepower expenditure is undoubtedly the tractor operated in conjunction with trailers.

A large volume of materials can be moved with one man, one tractor and a few trailers at scarcely any greater cost than is possible for one man to move a few hundred pounds on a hand truck, and requiring no more aisle space.

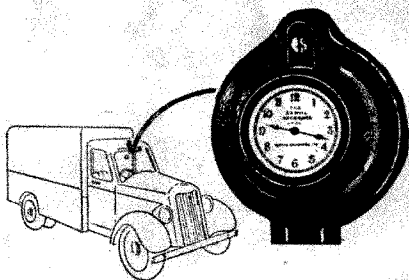
Thus, the tractor-trailer system lends itself admirably to the receipt, transfer and delivery of parcelled and packaged goods.

These operations nearly always involve concentrated hauls, which are easily handled by a tractor, while permitting easy sorting and classification.

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Servis Records are vital to Commercial Transport. They provide infallible proof of all journeys, including running time, loading time and idling time. They provide proof that precious petrol is being used only as authorised. They show whether overtime on any job was justified. They provide irrefutable evidence of compliance with Road Haulage Acts. They ensure 48 hours' work for 48 hours' pay.

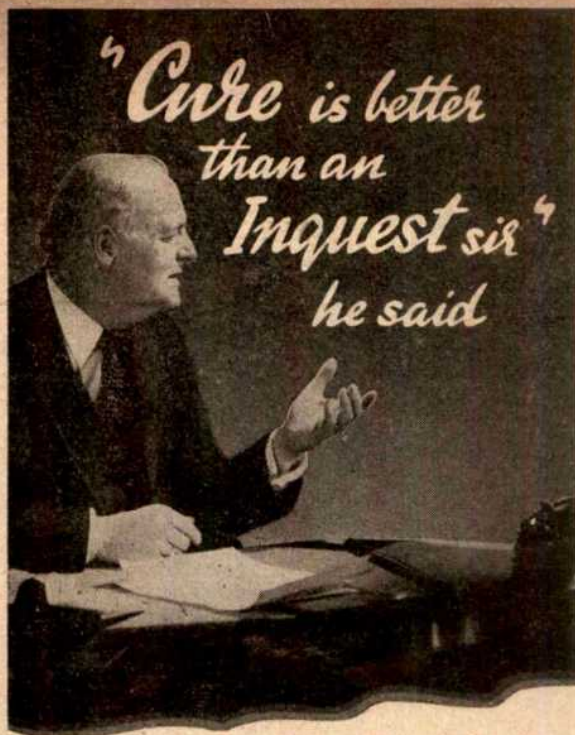
Servis Recorders do this because they automatically and accurately record this information on the lorry itself. They are easy and inexpensive to install. May we send you free particulars?



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FOR MACHINES AND LORRIES

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"... by the time the inquest comes round, the business is dead."

"Well," said I, "What's the cure?"

"Ah! sir," he replied, "Before I can answer that I must know the trouble. When you call in your doctor, his first job is to diagnose. He cannot prescribe the remedy until he has recognised and located the disease.

"It applies in equal measure to the business doctor.

"Do you know, sir, the old Chinese method of paying your doctor so long as he keeps you well, but stopping payment as soon as he lets you fall sick? That is an excellent principle. It is the one I want to put to you now."

"Cure may be better than an Inquest," I chipped in. "But Prevention is better than Cure."

"Exactly," he agreed heartily. "You've made the point for me. For, Prevention is the basis of my story. It demands the installing of a master instrument giving a graphic presentation and a control at sight, so obvious that potential faults are spotted before they can ever develop.

"Are you interested, sir?"

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Are you sufficiently interested to know the rest of the story? Send 1/- for the booklet mentioned herein. It will be the best disbursement of petty cash your business ever made. Send to Dept. B 2, Kardex Visible Control Systems, 1-19 New Oxford Street, London W.C. 1. Tel.—Chancery 1888.

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BRANCHES THROUGHOUT THE PROVINCES

The photograph reproduced in Figure 1 shows the tractor, details of which were given in the June issue of BUSINESS.

New Street passenger station, Birmingham, is typical of a central distribution point at which a vast quantity of parcel traffic requires a comprehensive system of operation, in order to avoid congestion and ensure that parcels reach their destination in the shortest possible time.

The handling of this traffic is simplified by a zoning method, which is in operation throughout the entire L.M.S. system, whereby all stations in the country are covered by approximately 140 zone numbers.

Station Layout and Equipment

There are eight through platforms and six bays; the main platforms being connected by subways at the North and South ends. These subways are linked up to the platforms by parallel slopes with a gradient of 1 in 8. There are two parcels offices, one serving the Midland and the other the Western division of the L.M.S. Both these offices are connected to the subway by lift.

Two large sorting cages have been constructed on the platforms, one on platform 6 on the Midland Division side and the other on platform 3 on the Western.

The major proportion of parcels traffic is carried by special parcels trains, with the exception of perishable and specially consigned livestock traffic, and parcels for local stations not served by parcels trains, which are conveyed by ordinary passenger services.

Four-wheeled barrows are employed for parcels handling; to move these barrows, laden or empty, by manual effort would be difficult, as even if labour were available, the extensive haulage involved, together with the gradient of the subways would so retard the work as to bring it to a standstill.

This work, however, is particularly adaptable to tractor haulage. Eight tractors cover the movement of "Forwarded" and "Received" traffic, negotiating the 1 in 8 ramps from the subways during each movement. A maximum of two four-wheeled platform barrows only are hauled by tractor at one time via the subways due to the gradient and sharp angle turn at the base of each to the main cross subway.

Parcels Movement

The handling of parcels at New Street Station can be divided into three groups, viz. :—

A. Forwarded Traffic—Handed in and collected at Birmingham for despatch.

B. Received Traffic—Arriving at New Street for delivery in the Birmingham district.

C. Transfer Traffic—Passing through Birmingham to other destinations involving interchange of trains or transfer between the Midland and Western Divisions of the Company's system.

A. Forwarded Traffic

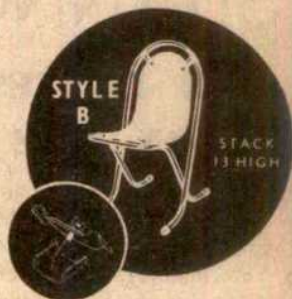
Traffic brought in by the public for despatch is accepted at the appropriate parcels



"A Paying Proposition" SAYS TEDDY BROWN

Strong and durable, with tubular frames and comfortable one-piece flexible seats and backrests, Stak-a-Bye tubular Steel Chairs are sufficiently light for even a girl to carry six at a time. 40 "A" type chairs, when stacked vertically, stand but eight feet high and occupy an area only two feet square. "B" type chairs are specially designed for use on lawns and beaches, but will only stack 13 high. Hygienic and easy to keep clean, their attractive non-fading plastic finish, in various colour combinations will defy atmospheric conditions whether used in or out of doors. Fixed Retail selling price of both patterns—27/9 each, plus 6/7 Pur. Tax.

A special rubber-tyred trolley is available which enables a whole stack of 40 chairs to be moved with ease.



This special clamp has been designed to hold Stak-a-Bye Chairs rigidly together in rows.

STAK-A-BYE tubular STEEL CHAIRS

SEBEL PRODUCTS LTD., 39/41, NEW OXFORD STREET, W.C.1.

TEMPLE Bar 0786-7
Scientific S.B.S.

JULY, 1946



Fig. 1. A large volume of material can be moved by one man using this petrol tractor

office according to its destination. The greater proportion of forwarded traffic is collected by L.M.S. cartage teams from respective firms and conveyed to the parcels office, where it is documented.

Marked with the zone number, indicating destination, at the time of booking, which is the guide for the parcels staff until the consignment is safely delivered at destination, the parcels are next sorted on to four-wheeled barrows under indication boards on which are shown the various section numbers,

and when fully loaded, the barrows are transferred by lift to the subway where they are collected by tractor and hauled up the ramps to the appropriate platforms for despatch. To facilitate the correct loading the rail-vans are also clearly marked with the destination zone number.

B. Received Traffic

Parcels arriving in New Street for delivery in Birmingham or transfer are unloaded from the trains on to four-wheeled

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On Highland War-cries



A FAMOUS American publicist, on the subject of advertising slogans, made the statement: "A slogan has just about the same relation to a successful (advertising) programme as a college yell has to a University education."

His analogy is a good one. SLOGAN comes from the Gaelic "sluagh-ghairm", meaning a Highland war-cry. War-cries don't win wars. College yells don't win football matches; still less, do they put people through examinations.

Slogans alone do not make advertising campaigns, nor sell products or services. They are part—admittedly often a most important part—of a whole.

Whether the slogan be political or commercial, it's what's *behind* it that really matters. Highland endeavour

was *spurred on* by the "sluagh-ghairm" just as British resourcefulness *responded* to a "Go to it!"

And so with Electricity . . . that it is a wonderful thing is a simple, but often-overlooked fact. In stating this slogan-wise it is hoped and planned (since hope, after all, must enter into all our plans) that the millions who use Electricity and take it so much for granted will become more conscious that it *is* wonderful and *is* becoming progressively more wonderful.

The click of a switch, and there's immediate light or rapid heat or constant cold or immense power. Were not such results immediately forthcoming, our "sluagh-ghairm" *would* be just a cry in a Highland wilderness.

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*...wonderful
thing!.*

★ A Sluagh-ghairm

BRITISH ELECTRICAL DEVELOPMENT ASSOCIATION, 2 SAVOY HILL, LONDON, W.C.2

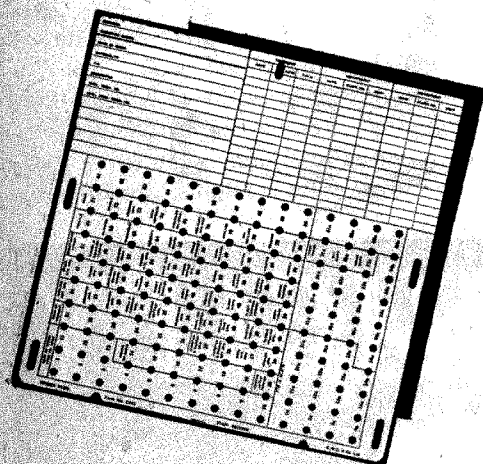
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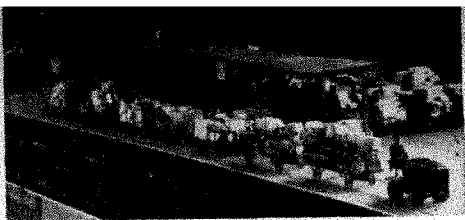


Fig. 2. The sorting cage and a fully loaded trailer train of wagons on its way

barrows and hauled (with the exception of bulk "train to train" transfers), by tractor to the sorting cages for segregation.

On arrival in the cage, sorting is carried out progressively in accordance with the zone numbers as previously indicated, and the barrows subsequently hauled to the appropriate services for despatch; those for despatch from the other Division are interchanged between the cages.

Parcels for city delivery are conveyed from the sorting cage to the parcels office for documentation prior to morning or afternoon delivery.

This procedure is adopted in all cases with the exception of platform 1, where parcels are pre-sorted; those to go forward being left on the platform and eventually loaded into trains departing from platform 1, while transfer and city delivery traffic is hauled by tractor to their respective sorting cages.

A panoramic view of the "Western" sorting cage is shown in Fig. 2 which also gives a clear view of the platform ramps leading to the subways and a tractor hauling loaded four-wheeled barrows to a parcels train waiting in a loading bay.

Tractor-Trailer System

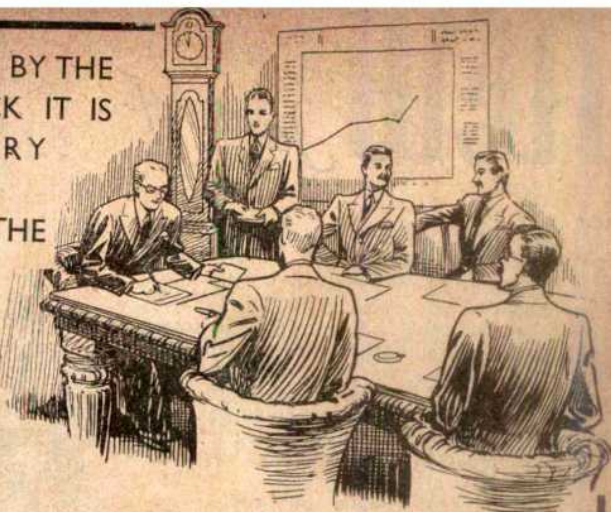
The principle underlying the efficient handling of materials is to save; to save time in production and distribution; to save costs in the process of manufacture.

That the tractor-trailer system achieves these desired results is evident from reports of tests that have been carried out, one of these revealing that one tractor, eight trailers and three men did more and better work than had formerly been done with 24 men using two-wheeled hand trucks and the industrial rail system. The main appeal to those employing this system of materials-handling was, first, the extreme flexibility of the tractor-trailer method. With it buildings can be entered through narrow doors, and aisles, and the trailer go direct to the point of origin or destination of the materials handled, thus eliminating many re-handlings.

Second, the ability of the tractor-trailer method quickly to adjust material movement to accommodate and meet the emergencies that arise from day to day, due to changing seasonal demands; and third, the great economy of operation as compared with many other methods of materials-handling.

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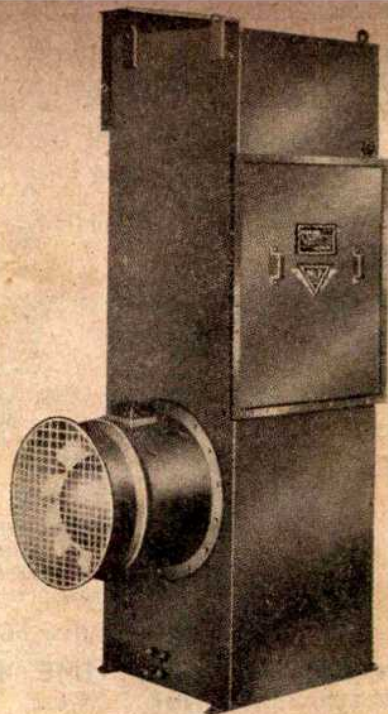
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20—A Cool Type

THE coolers manufactured by Heenan and Froude Ltd., of Worcester, have long been famous. Their Patent "T" Type Cooler, which was perfected and introduced in 1938, was equally suitable for cooling water in various applications, or for cooling quenching-oil or brine in heat treatment shops. Of low cost, its positive cooling action was not dependent on prevailing winds, whilst cutting of evaporation losses to a minimum resulted in a saving of water.

Heenan and Froude have now brought out another cooler, the "P" Type, which supersedes but follows the general lines of the 1938 model. It is of all metal construction, incorporating forced draught, which is now provided by a high efficiency axial flow fan instead of the old centrifugal one. Other new features give a reduced first cost, decreased power consumption, and greater ease of maintenance. There are also differences in the sizes and construction of the cooling screen.



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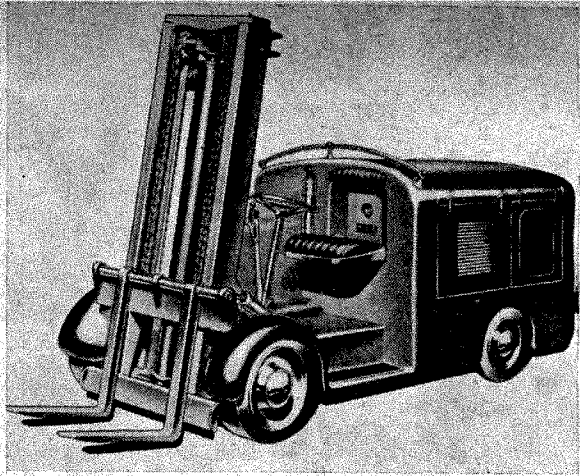
and at **MANCHESTER & BIRMINGHAM.**

21—Capable Conveyancer

DURING the war period, due to the shortage of manpower, the handling of material became highly specialised. Rapid strides were made in the United States in this matter by the use of fork lifting trucks. These trucks were used extensively by the American armed forces in all parts of the world and they have also been supplied, through Lend-Lease, for the use of our own forces.

A British fork lifting truck, the "Conveyancer," has now been developed by Electro-Hydraulics (Messier) Ltd. This machine, in its standard form or with the addition of special attachments, is capable of handling all kinds of raw materials and finished products for all sections of industry.

It can be widely used in stores and warehouses and, in addition to providing the most speedy means of handling goods with a minimum of manpower, its use also enables the fullest advantage to be taken of storage space. It is also particularly suitable for the loading of aircraft, being capable of transferring loads from lorries or stores over any

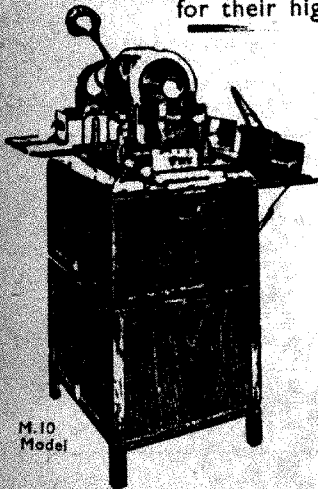


distance and actually depositing the goods inside the fuselage.

Several models of the "Conveyancer," of various powers and sizes, will soon be available, but the one at present in production is capable of picking up, lifting and depositing loads up to two tons in weight from floor level to a height of nine feet. Its road speed,

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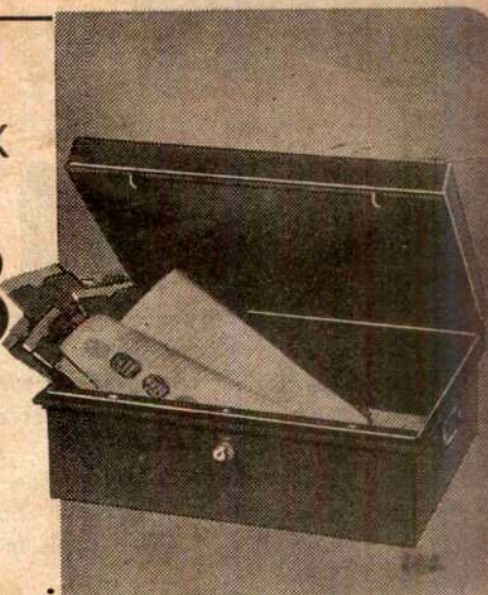
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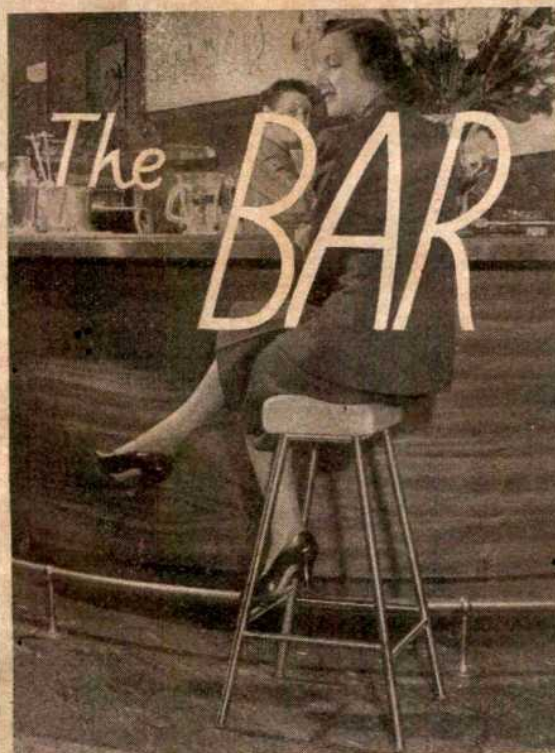
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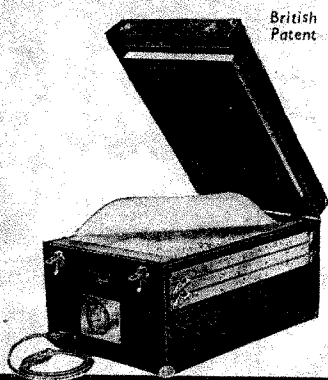
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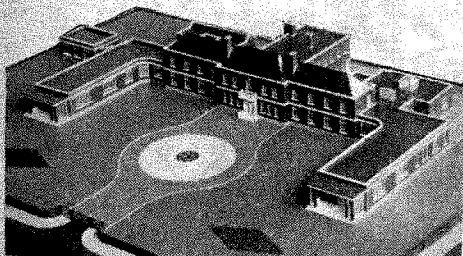
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23—This Shows Them

BY means of Rodre (a fitting which is comprised of a framework of metal rods), glass shelves, brackets and clips to which are allied hundreds of shop fittings, can tastefully exhibit any article ranging from a small jewel case to a side of bacon.

The shopkeeper's task is simplified by the easy removal of glass shelves and clips without the disarrangement of the whole display. Also, by means of strong brackets and clips, showcase glass may be set to any degree needed to conform to the "balance" of the display.

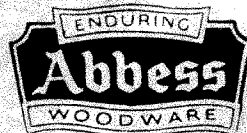
One of the main advantages of Rodre is that it is designed to exhibit the article and not the fitting. When displayed in a window, all that is seen of the display fittings are the glass shelves. Like so many popular inventions, Rodre combines simplicity with durability. The manufacturers, Messrs. S. Barford & Son, state that it is intended primarily for home use, though some fittings will be exported.

24—Good On Reflection

THE Metropolitan-Vickers Electrical Company has just introduced new types of trough reflectors for use with 4 foot 40 watt fluorescent tubular lamps. These reflectors are manufactured in one and two-lamp units for industrial situations. The one-lamp type comprises a heavy gauge sheet steel reflector, stove enamelled grey outside and white inside, with the control gear accommodated above the reflector.

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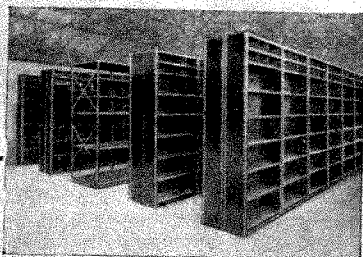
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BATCH TECHNIQUE COSTS TOO MUCH

Continued from page 69

these two reveals that very little structural alteration was necessary and that the most difficult machines to move, i.e., die-casting lathes and welding machines were not even touched but the revised layout was centred around these fixed points.

The new stores centre was grouped just inside the entrance, which because there was already a fixed draught screen, lent itself ideally to this purpose. This stores took the form of an amalgamation of the existing stores in the shop. The drills and taps were moved forward to bring them in line with the work flow. The fettling bench and the fitting bench were turned round for the same purpose. The casting stores was completely eliminated as also was the inspection bay.

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All of the new layout was completed over a week-end, and as each operator arrived on the Monday morning, so there was either on the bench or at a spot adjacent to it, a detailed instruction sheet giving the information necessary for that operator to play a full part in the new programme.

This meant a scrapping of the usual paper work system (route card, job card, inspection movement card, checking card, etc.) and instead was a unit job sheet which merely gave

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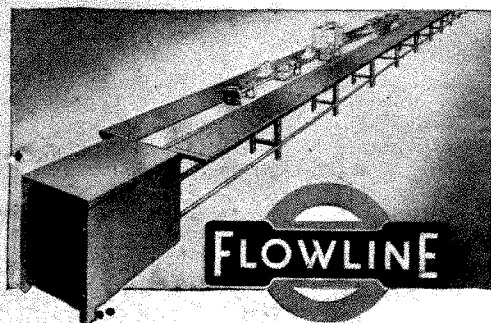
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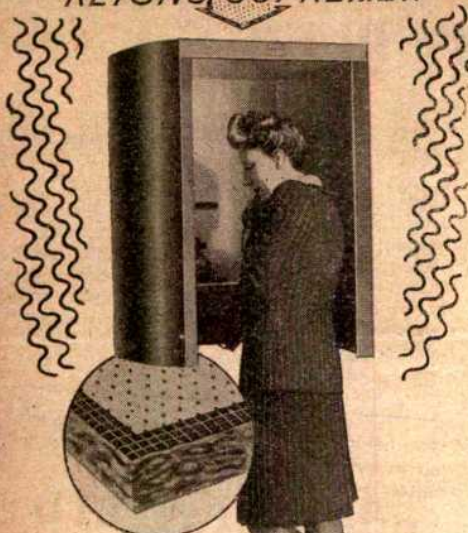
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details of the parts passing through that particular operation.

Since all the operations were in strict sequence, it was clear that it became easy to assess the target attainment figures by merely reading the number off the last operation at any given time and ignoring the balance of work actually passing through.

It will be seen, of course, that on the Monday morning the later stage operators had to wait for work to arrive at their respective bay and to cover which discrepancy the operators were booked on to day work and paid a commensurate bonus as compensation for the non-effective work.

The savings on this particular job worked out at £260 per month, including the cost recovery factor for the installation of the roller conveyors, but additional output was increased by 13 per cent., and the operators' earnings increased by a like amount.

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NORTH-EASTERN ELECTRIC

Directorial Changes

THE Rt. Hon. Viscount Ridley has joined the Board of the North-Eastern Electric Supply Company Limited and has been elected Chairman in succession to Mr. R. P. Sloan who retired after the Annual General Meeting.

Lt.-Col. S. E. Monkhouse, Managing Director, having reached the retirement age after completing 42 years of service with the North-Eastern Electric Supply Company Limited, will retire from that position on September 30th, 1946.

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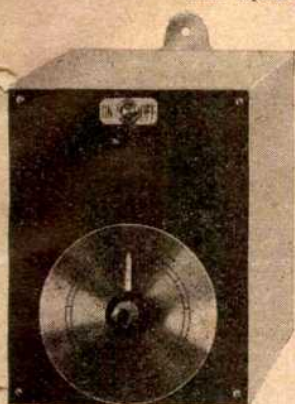
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Health- in Industry



What Management Can Do For The Disabled Worker

By Dr. DONALD STEWART, M.D., F.R.C.P. (Edin.)

AS the reconversion of British industry goes on and the demand for goods, both for the home market and export becomes greater, the shortage of manpower in this country becomes more and more painfully evident. The outstanding problem of almost every industry in attaining production targets is shortage of labour.

In 1944, an Act was passed, which, apart from its humanitarian aspects, was clearly designed to make the best use of what labour was then available to the war production machine. The Disabled Persons (Employment) Act promised facilities for industrial rehabilitation courses for disabled people over 16 years of age who are unfitted because of injury, disease or deformity and who need such facilities to render them fit for their previous work.

The need for such an Act was great enough in 1944. It is, if possible, even greater now. For this reason, we are publishing in this and the next issue of *BUSINESS*, a summary of a paper on Industrial Rehabilitation read to the Royal Society of Medicine by Dr. Donald Stewart, M.D., F.R.C.P. (Edin.). It is Dr. Stewart's view that occupations "conducive to restoration of fitness" can very well be provided in normal industry and in special rehabilitation shops and factories.

No matter how efficient the hospital, he says, how good the treatment, and how much contact the social service or almoner's department has with the factory, there can be no effective return to work, and therefore no full rehabilitation and implementation of the Act, without the co-operation of the employer. His contribution must include the following:

(a) The promise of continued employment can remove the fear of insecurity, a potent means of retarding recovery. It is a fact that many disabled workers already in employment are unwilling to put their names on the Register of Disabled Persons because

of the fear of losing their jobs. Some statement from employers' organisations may therefore be necessary at an early date.

(b) A promise of alternative work can be made if the employee is unfit for his pre-accident job. To be effective, this must be true alternative work under medical supervision and not light work specially created as a charity.

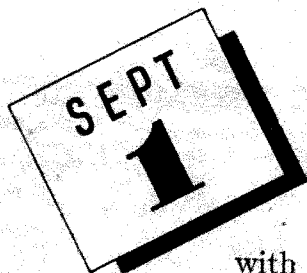
(c) The possibility of re-training for alternative work should be considered. This can only be done in the larger firms: Government Training Centres and certain extra-industrial centres can theoretically cover the remainder of industry.

(d) Assistance on matters arising under the Workmen's Compensation Acts is important. The present Acts, although financially more attractive within recent years, can still do much to retard recovery particularly in long-continuing cases by creating distrust of the employer on the part of the worker. Some insurance companies have contributed in no small way to this. But even with the new Industrial Injuries Act, there will be much help required from management.

(e) It is important that employers should appreciate the fact that a man cannot be unfit one day and on the next, in a different environment, be really fit for full work. The goodwill of managers and foremen (the real executives of industry) must therefore be obtained for the worker during what is often an awkward phase in recovery—that period of time between being signed off by the insurance practitioner or the hospital and returning to his original occupation.

(f) The provision of rehabilitation workshops in the larger organisations, e.g., every factory or group employing 5,000 workers or more (to include medical as well as surgical cases), or on a regional basis by the institution of communal rehabilitation factories linked with hospitals must be considered.

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Personnel management and rehabilitation.—

It should be a primary responsibility of personnel management, under the present system, to play a part in the supervision of the return to work of the sick or injured worker. This applies to all types of industry, and to all sizes of organisation. In the larger firms personnel management and industrial medical service must work in the closest collaboration. One cannot function efficiently without the other.

In the smaller industrial unit, *e.g.*, the factory with less than 300—400 employees, there is usually no special official appointed as personnel or welfare officer and this function therefore becomes the direct responsibility of the works manager. Because the majority of firms in this country come within the "small" category, and because over 50 per cent. of factory workers (comprising 75 per cent. of productive industry) are employed in units of 250 or less, the education of works managers and foremen in the meaning of rehabilitation, and the part they must play in it, becomes increasingly important.

Light work or alternative work.—A number of firms have appreciated the need for "light" or "alternative" work and have provided facilities within their own limitations; but there is no doubt that the finding of such work is a matter of considerable difficulty taking industry as a whole, and in the small organisation is frequently impossible. In

certain large firms, however, a number of occupations are specially allocated for convalescent sick and injured patients as part of general welfare schemes. The main criticism of this procedure is that cases are often not under adequate medical control, and that this "allocation" becomes a method of dumping and "losing" unwanted workers, often to reduce the so-called "compensation costs."

Objections to alternative or light work can be summed up as follows: (a) It is frequently hit-or-miss therapy; (b) it is difficult to find in the great majority of industries; (c) it is difficult to keep under medical control, and may actually be harmful to the patient by retarding or even permanently interfering with full functional activity; (d) it is frequently not liked by managers, foremen, and by workers themselves, as the productive effort of the industrial unit—the gang or team—may be interfered with by the presence of a semi-fit man; (e) managers and foremen may resent the increase in overhead expenses; (f) the patient is apt to be "lost" in the works and frequently never returns to his pre-accident work; alternative work, therefore, can conceivably become nothing more or less than a scrap-heap for the partially disabled man; (g) it is sometimes created at the special request of the insurance company concerned, where lump sum settlements are involved, as a basis of argument in the County Court in favour of lower settlement.

GERM-LADEN DUST CAUSES INFECTION

Extract from the MINISTRY OF HEALTH BULLETIN in the Pharmaceutical Journal, 5/1/46.

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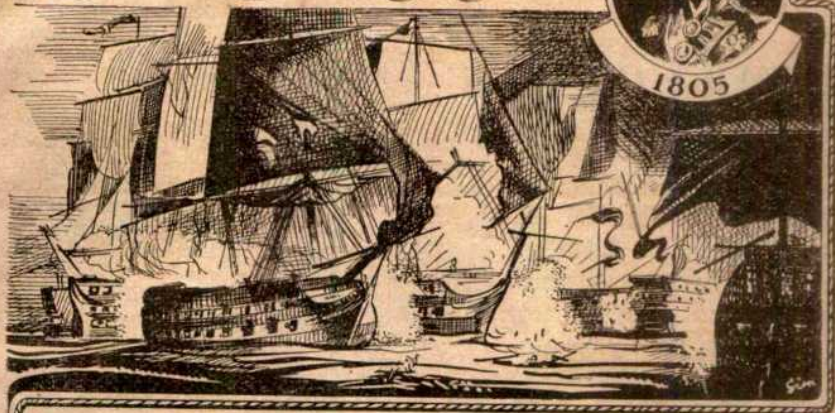
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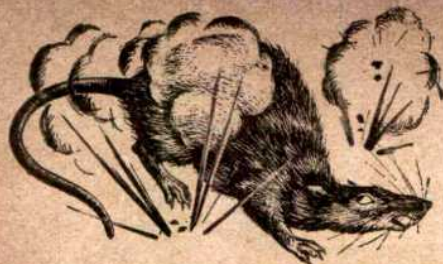
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B

The Contribution of Industrial Medicine.—

In firms where an industrial medical officer is employed, supervision of return to work of the injured or sick worker is one of his primary duties. So important is this work that it is a main reason for the extension of medical services to cover the whole of industry. He can contribute to the clinical implementation of the Act in a number of ways:

(a) He should obtain accurate information not only of the incidence of sickness and accidents but of the progress of sick and injured workers. The value of a good record-keeping system is therefore emphasized.

(b) He should devise a method of reviewing progress, as required, with hospital staffs and with insurance practitioners. To this review his special knowledge of the work to which the sick or injured worker will return is a valuable contribution; his advice may only be useful in a proportion of cases to begin with, but the number will grow. He should look on the local hospital as his base; medical departments in industry should become outposts of hospitals and not work in isolation.

(c) All accident cases absent for three days or more should be seen by him before recommencing work.

(d) All sickness cases absent three weeks or more should be seen by him before recommencing work. To carry this out effectively, he should establish close liaison with local general practitioners. Later this can be done through health centres.

(e) He should develop an adequate follow-up service in connection with (c) and (d), and in this part of his work the help of a good nurse is of much importance.

(f) He should compile a list of the different occupations in his firm, analysing jobs from the health point of view and in relation to capacity for work, with a view to providing alternative work for specially selected cases conditional on their being under his medical supervision. It must be clearly stated that the doctor's contribution to this is one of job-allocation and is dependent on a job-analysis schedule being provided by industry. This development in medicine is therefore a two-way process, and depends for its success on collaboration between management and the medical officer.

(g) He should consider the advisability of having a social service worker on his own staff. This has already been accepted in principle by certain large firms and is a development of some importance in industrial medicine.

(h) The whole-time industrial medical officer should investigate the possibility of setting up a special workshop in his own organisation for the rehabilitation of selected sick and injured workers. Selection should be made in full collaboration with hospital physicians and surgeons, who should act in a consultative capacity in this respect and so themselves learn something of industrial conditions.

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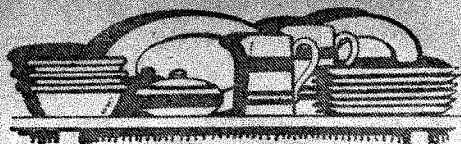
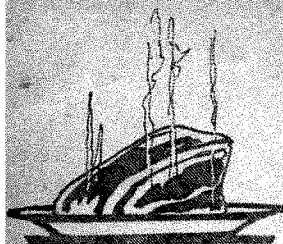
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Canteen

Summer Salads

Are the Answer To Cooking Fat Shortage

By F. A. MOON

of Business Canteen Advisory Panel

THIS summer is a preparation period for next winter and the wise caterer will take advantage of the short time at his disposal to build up his reserves of the fats which will be necessary in our winter diets.

During the hot weather we can manage without the heating elements such as fats if we substitute other suitable menus, but the cold weather will bring a higher demand for steamed puddings, chips and other fried foods which it will be impossible to satisfy out of the present fat ration. Conserve these fats during the hot weather and the reserve will be available for use when needed.

It is appreciated that many customers will ask for a cooked meal every day and it will be necessary to educate them into salad foods. Given the opportunity, it will be found that at least one third of the customers will prefer a salad meal, and the conversion of a few more will result in a saving of half the fat ration. Next winter will certainly be very difficult, and I can see no possibility of the present ration of this commodity being raised.

Several fruit and vegetable menus are available, but to give these in detail would require volumes, and as the preparation of salads is regarded as elementary, I feel that it should only be necessary for me to give the various constituent parts as a reminder to use these foods when available. The Ministry of Food leaflets dealing with salads give in detail the method of preparing certain specific salads and any ordinary cookery

book usually contains a section on the subject.

The canteen manager can use his own ingenuity in inventing new salads either in bulk or as individual dishes, and as they are very easy to prepare, he will find that with the raw materials at his disposal he can concoct dozens of different variations.

Another advantage of salads lies in the fact that one is not working to a strict time limit as in the case of a cooked meal and whilst it is advisable to prepare the fruit and vegetables as late as possible, the meal is not spoilt through going cold.

It is possible that one member of the staff is expert in this class of work, and if a certain amount of decorative work can also be done there will be a feeling of pride in the achievement of attractive dishes.

By the blending of the various colours in green salads, beetroot, radishes, tomatoes, etc., and the addition of small squares of toast with a topping of creamed cheese and a sprig of parsley, a salad can be made to look more attractive than a cooked meal.

Grating, chopping, slicing and mincing all help to provide a variation at a cost no greater than the usual roast beef and 2 veg., and if the saving in fuel is taken into account the caterer will find that he is well paid.

It only remains for me to give a list of suitable materials to act as a reminder and leave the caterer to blend the various parts into an appetising and attractive whole.

HINTS to CATERING MANAGERS



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everyone
appreciates
— a good
cup of tea!*

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BELL STREET, LONDON, N.W.1

Telephone: PADDINGTON 8222

B.25

Vegetables

Heart of cabbage (grated)
Carrots
Cold peas
Celery
Cucumber
Potatoes (raw or cooked)
Beans, ditto
Spanish onions
Spring onions
Beetroot
Radishes
Tomatoes
Turnips
Swedes
Parsnips
Water cress
Mustard and cress
Cauliflower
Spinach
Leeks
Lettuce
Marrow

Accompaniments

Cheese
Sardines
Pilchards
Cold meat
Tinned herrings
Soused herrings
Salmon
Shrimps
Cold bacon
Cold ham
Corned beef
Tongue
Corned mutton
Spam
Minced meat balls
Cold chopped fish

Trimnings

Apples
Raisins
Dates
Parsley
Mint
Horseradish
Mayonnaise
Herbs.

It is important to see that the meal is set out on the plate attractively, seasoned properly with mayonnaise, herbs, etc., and served in a crisp fresh condition. Vary the potatoes, turnips, carrots, etc., by serving alternatively cooked and raw, and you will be surprised at the demand.

New Pots for Old

By "GADGET"

COMMERCIAL kitchens, however small, use the heavy cast round or oval boilers of the "Dixie" type, for one purpose or another. Also in use are the large cast iron pans. Some are enamelled, but the bulk have "tinned" interiors. It is a well known fact that once a pan has been "burnt," it cannot be used again without grave risk of burning the contents, and so a most expensive item of equipment is cast aside as useless.

Replacements are almost impossible at present, but the damaged article can be made as good as new by having the interior "re-tinned," which is a process of coating the iron with molten tin. However, difficulties arise owing to the shortage of skilled labour, and it has been practically impossible to have re-tinning work carried out.

Experiments are now taking place, involving a new process of metalising. The process is already being used successfully in industry, and consists of spraying powdered metal through a flame, so that the molten metal gives a coating of any desired thickness to the object. Used on external work,



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THE BRITISH ARMY.

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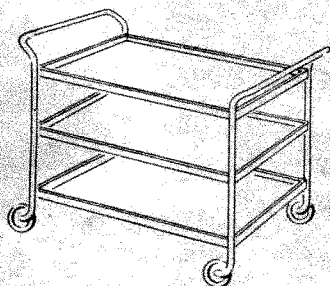
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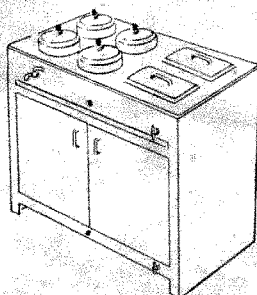


Our Policy...

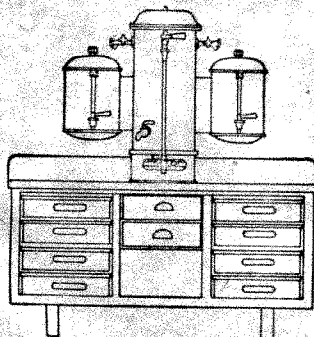
TROLLEYMASTER



SNACKMASTER



AQUAFONT BOILERS



EWART CATERING EQUIPMENT LTD. who are the leading trade manufacturers of catering equipment, are concentrating the full output of their modern factory at Brent Crescent, North Circular Road, London, N.W.10 on the three products illustrated on the left, for home and export markets. Attractive brochures are available describing fully each range of units, and our definite policy of supplying our equipment only through the leading Kitchen Engineers and Gas and Electricity Undertakings, ensures that customers receive sound advice before sales, and we 'Hand-pick' our selling agents to ensure they are capable of giving efficient servicing after sales, which is so important to our hotel, restaurant and canteen friends.

Your Profit

EWART CATERING EQUIPMENT LIMITED

12 TROJAN WORKS, BRENT CRESCENT, N.W.10

6655

Telephone: ELGAR 5281

guarantees of up to 50 years are being given against the need for further treatment. Thus, corrosion and the need to paint metal work are being eliminated.

As nothing of a toxic nature is used in connection with the process, the results should be most satisfactory when pots and pans are recoated by this method. Subject to the satisfactory completion of experiments, one or more collecting centres will be installed in London, to which old but sound pots and pans may be sent for re-coating. When the scheme is more advanced, fuller details will be given, but meanwhile it would be advisable to keep those old pots and pans, in view of the possibility of "new for old."

Another long-felt need is shortly to be fulfilled. This is in connection with sink "tidies." There will be small ones for the housewife, as well as large receptacles for commercial use. Every housewife hates emptying the sink tidy. Furthermore, it stains the sink, is unsightly, and is difficult to clean.

A patent has been applied for in connection with an approved type of sink tidy. It will be more like a pan in appearance and shape, but the handle will be different. A perforated inner container will be suspended inside, and a lid will cover the whole. The inner container will also have a handle, so that

the housewife may empty the contents without soiling the hands.

The outer container will retain the liquids, which may be emptied at will, instead of being permitted to run unchecked as with an ordinary sink tidy. Furthermore, to clean this new tidy, the container may be filled with water, boiled and sterilized. Even when not emptied, the tidy will be neat in appearance, owing to the fact that the contents are covered.

The tidy may be kept on the drainer or a nearby shelf, instead of standing in the sink. Larger models will be made for commercial use, but of different patterns, some being suitable for standing under the sink. Investigations as to the best methods and source of manufacture are now taking place, and as soon as these preliminaries are settled, it is intended to go ahead on production.

Fan Tale.—Rectangular inlet boxes are usually provided at the axial inlets of centrifugal fans for connection to the inlets and ducts which convey air to be acted upon by the fans. A new invention enables losses in the boxes to be reduced by providing in them air-guiding vanes which prevent the air entering the box from crowding directly towards the axial inlet to the fan.

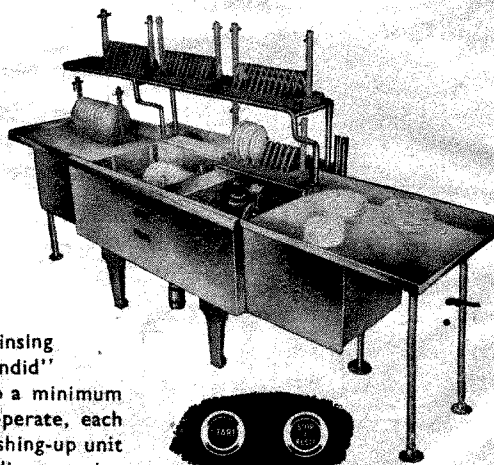
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THE 'SPLENDID' WAY



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A STAINES

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PRODUCT

STAINES KITCHEN EQUIPMENT CO. LTD.

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